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REPORT

OF THE

TESTS OF METALS

AND

OTHER MATERIALS

FOR

INDUSTRIAL PURPOSES

MADE WITH THE

UNITED STATES TESTING MACHINE AT WATERTOWN ARSENAL,
MASSACHUSETTS,

DURING

THE YEAR ENDED JUNE 30, 1885.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1888.

and long-continued strains upon wrought-iron rods, as exhibited in railroad-car axles and locomotive driving-rods. These will also be continued during the year.

Mr. J. E. Howard, C. E., has, as heretofore, operated the testing-machine, made the tests and the reports. His zeal, skill, and industry in the performance of his work has been conspicuous.

The following is a statement of funds received and expended:

Amount appropriated for testing-machine and testing work		$10,000 00
Received during the year for private tests		910 25
		10,910 25
Amount expended for services and labor	$6,879 52	
Amount expended for steam-power, tools, implements, repairs and improvements	2,196 83	
Amount expended for material for testing	1,833 90	
	10,910 25	

I also append a list of private parties for whom tests were made, giving the number of each.

Very respectfully, your obedient servant,

F. H. PARKER,
Major, Ordnance Department, U. S. A., Commanding.

The CHIEF OF ORDNANCE, U. S. A.,
Washington, D. C.

REPORT

OF

TESTS ON THE STRENGTH OF STRUCTURAL MATERIAL

MADE AT THE

WATERTOWN ARSENAL, MASS.,

ON THE

400 TONS TESTING-MACHINE,

DURING THE

FISCAL YEAR ENDING JUNE 30, 1885.

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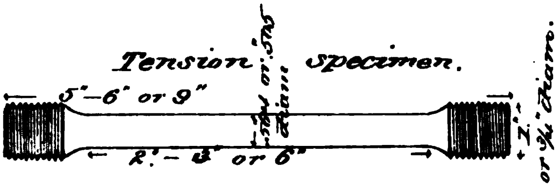
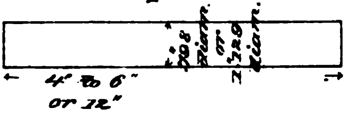
Shape of Specimens, Gun tests.

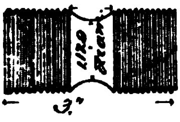
Tension specimen.



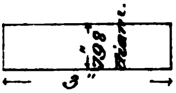
Compression



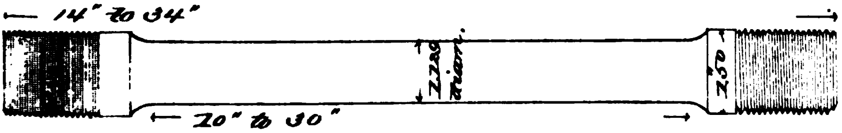
Tenacity



Crushing



Tension, Cast Iron.

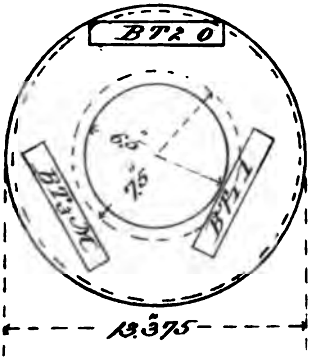


S Ex 36 49 1

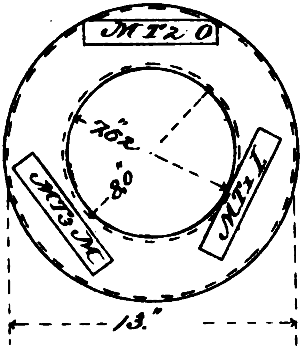
8" Converted Rifles.

General drawing showing the location of specimens numbered 1 to 3 breech and muzzle ends of the different tubes.

Breech



Muzzle



TESTS OF STRENGTH OF STRUCTURAL MATERIAL.

1.—8-INCH CONVERTED RIFLES.

SPECIMENS FROM STEEL TUBES.

DETAILS OF TESTS.

TUBE No. 1.—8″ *Converted Rifle.*

No. 731.

Marks, $\overset{8\ T_1}{B\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001000	.000133	0.	....	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001033	0.	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001167	.000067	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001333	.000066	....	....	Elastic limit.
11,250	45,000	.010400	.000067	.008767	.008767	
11,500	46,000	.010933	.000533	....	....	
11,750	47,000	.011433	.000500	....	....	
12,000	48,000	.012867	.001434	....	....	
12,250	49,000	.014167	.001300	....	....	
12,500	50,000	.016100	.001933	.014267	.005500	
12,750	51,000	.016667	.000567	....	....	
13,000	52,000	.018067	.001400	....	....	
13,250	53,000	.019867	.001800	....	....	
13,500	54,000	.021867	.002000	....	....	
13,750	55,000	.024000	.002133	....	....	
14,000	56,000	.025833	.001833	....	....	
14,250	57,000	.026600	.000767	....	....	
14,500	58,000	.028700	.002100	....	....	
14,750	59,000	.030700	.002000	....	....	
15,000	60,000	.033000	.002300	....	....	
15,500	62,000	.039167	.006167	....	....	
16,000	64,000	.044667	.005500	....	....	
16,500	66,000	.051500	.006833	....	....	
17,000	68,000	.060500	.009000	....	....	
17,500	70,000	.073333	.012833	....	....	
18,000	72,000	.1033	.029967	....	....	
18,480	73,920	.1767	.0734	....	....	Tensil strength.
14,600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8607
Hardness	11.81
Tensile strength, per square inch of original section ....pounds..	73,920
Elastic limit, per square inch of original section ....do	44,000
Elongation per inch after rupture ....inch..	0.3000
Elongation per inch under strain at elastic limit ....do....	.001333
Reduction in diameter at point of rupture ....do....	.194
Reduction in area after rupture, per centum of original section	57.0
Position of rupture	″.50 from middle of stem
Character of broken surface	silky
Elongation of inch sections	″.32*, ″.36*, ″.19

No. 732.

Marks, $^{8\,T_1}_{B\,T_2O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	.000033	.000033	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001433	.000100	....	....	Elastic limit.
11,000	44,000	.007267	.005834	....	....	
11,250	45,000	.007933	.000666	.006300	.006267	
11,500	46,000	.009067	.001134	....	....	
11,750	47,000	.009767	.000700	....	....	
12,000	48,000	.011067	.001300	....	....	
12,250	49,000	.011833	.000766	....	....	
12,500	50,000	.013100	.001267	.011167	.004867	
12,750	51,000	.013733	.000633	....	....	
13,000	52,000	.015000	.001267	....	....	
13,250	53,000	.015833	.000833	....	....	
13,500	54,000	.017333	.001500	....	....	
13,750	55,000	.019333	.002000	....	....	
14,000	56,000	.020667	.001334	....	....	
14,250	57,000	.021667	.001000	....	....	
14,500	58,000	.022833	.001166	....	....	
14,750	59,000	.024333	.001500	....	....	
15,000	60,000	.026033	.001700	....	....	
15,500	62,000	.029667	.003634	....	....	
16,000	64,000	.034000	.004333	....	....	
16,500	66,000	.038033	.004033	....	....	
17,000	68,000	.043500	.005467	....	....	
17,500	70,000	.050000	.006500	....	....	
18,000	72,000	.059333	.009333	....	....	
18,500	74,000	.068333	.009000	....	....	
19,000	76,000	.081667	.013334	....	....	
19,500	78,000	.1067	.025033	....	....	
19,770	79,080	.1567	.0500	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,080
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.90 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.21, ″.14

No. 733.

Marks, $_{-B}{}^{8\,T_1}_{T_2}M$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.001000	.000167	0.	....	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001200	.000067	.000033	.000033	Elastic limit.
10,250	41,000	.002467	.001267	....	....	
10,500	42,000	.004933	.002466	....	....	
10,750	43,000	.007067	.002134	....	....	
11,000	44,000	.008933	.001866	....	....	
11,250	45,000	.009500	.000567	.007833	.007800	
11,500	46,000	.010600	.001100	....	....	
11,750	47,000	.011400	.000800	....	....	
12,000	48,000	.012500	.001100	....	....	
12,250	49,000	.013600	.001100	....	....	
12,500	50,000	.015167	.001567	.013233	.005400	
12,750	51,000	.016000	.000833	....	....	
13,000	52,000	.017267	.001267	....	....	
13,250	53,000	.018500	.001233	....	....	
13,500	54,000	.019767	.001267	....	....	
13,750	55,000	.021400	.001633	....	....	
14,000	56,000	.023267	.001867	....	....	
14,250	57,000	.024833	.001566	....	....	
14,500	58,000	.026667	.001834	....	....	
14,750	59,000	.028333	.001666	....	....	
15,000	60,000	.030400	.002067	....	....	
15,500	62,000	.034667	.004267	....	....	
16,000	64,000	.040000	.005333	....	....	
16,500	66,000	.045367	.005367	....	....	
17,000	68,000	.052333	.006966	....	....	
17,500	70,000	.061333	.009000	....	....	
18,000	72,000	.073333	.012000	....	....	
18,500	74,000	.0967	.023367	....	....	
19,000	76,000	.1267	.0300	....	....	
19,085	76,340	.1567	.0300	....	....	Tensile strength.
16,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds..	76,340
Elastic limit per square inch of original section..........do....	40,000
Elongation per inch after rupture..........inch..	0.2333
Elongation per inch under strain at elastic limit..........do....	.001200
Reduction in diameter at point of rupture..........do....	.133
Reduction in area after rupture, per centum of original section..........	41.9
Position of rupture,..........	″.50 from middle of stem
Character of broken surface..........	silky
Elongation of inch sections..........	″.29*, ″.28*, ″.13

No. 734.

Marks, $\overset{8\,T_1}{M\,T_1\,I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000700	.000133	0.		
7,500	30,000	.000933	.000233	0.		
8,750	35,000	.001033	.000100	0.		
9,000	36,000	.001067	.000034			
9,250	37,000	.001100	.000033			
9,500	38,000	.001133	.000033			
9,750	39,000	.001167	.000034			
10,000	40,000	.001200	.000033	0.		
10,250	41,000	.001233	.000033			
10,500	42,000	.001267	.000034			
10,750	43,000	.001300	.000033			
11,000	44,000	.001367	.000067			
11,250	45,000	.001400	.000033			Elastic limit.
11,500	46,000	.001933	.000533			
11,750	47,000	.003500	.001567			
12,000	48,000	.006500	.003000			
12,250	49,000	.007167	.000667			
12,500	50,000	.008433	.001266	.006600	.006600	
12,750	51,000	.009167	.000734			
13,000	52,000	.009867	.000700			
13,250	53,000	.010833	.000966			
13,500	54,000	.012167	.001334			
13,750	55,000	.013033	.000866			
14,000	56,000	.014400	.001367			
14,250	57,000	.015500	.001100			
14,500	58,000	.016700	.001200			
14,750	59,000	.018000	.001300			
15,000	60,000	.019300	.001300			
15,500	62,000	.022367	.003067			
16,000	64,000	.025500	.003133			
16,500	66,000	.028667	.003167			
17,000	68,000	.031633	.002966			
17,500	70,000	.036000	.004367			
18,000	72,000	.040833	.004833			
18,500	74,000	.047067	.006234			
19,000	76,000	.055000	.007933			
19,500	78,000	.063167	.008167			
20,000	80,000	.077800	.014633			
20,500	82,000	.1033	.0255			
20,750	83,000	.1667	.0634			Tensile strength.

General summary.

Specific gravity		7.8592
Hardness		13.99
Tensile strength per square inch of original section	pounds..	83,000
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	2433
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.143
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ″.17, ″.17

No. 735.

Marks, $\overset{S\,T_1}{M\,T_2\,O}$
Diameter, ″.563.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	....	0.	0.	Initial loads.
1,250	5,000	0.000133	0.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000600	.000233	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001033	.000100	0.	....	
9,000	36,000	.001133	.000100	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001300	.000033	.000033	.000033	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001400	.000067	....	....	Elastic limit.
10,750	43,000	.005733	.004373	....	....	
11.000	44,000	.006500	.000767	....	....	
11,250	45,000	.007267	.000767	.005733	.005700	
11,500	46,000	.008367	.001100	....	....	
11,750	47,000	.009333	.000966	....	....	
12,000	48,000	.010167	.000834	....	....	
12,250	49,000	.011367	.001200	....	....	
12,500	50,000	.012733	.001366	.010900	.005167	
12,750	51,000	.013367	.000634	....	....	
13,000	52,000	.014600	.001233	....	....	
13,250	53,000	.015667	.001067	....	....	
13,500	54,000	.017067	.001400	....	....	
13,750	55,000	.017933	.000866	....	....	
14,000	56,000	.019600	.001667	....	....	
14,250	57,000	.020967	.001367	....	....	
14,500	58,000	.022333	.001366	....	....	
14,750	59,000	.023767	.001434	....	....	
15,000	60,000	.025667	.001900	....	....	
15,500	62,000	.029500	.003833	....	....	
16,000	64,000	.033167	.003667	....	....	
16,500	66,000	.037667	.004500	....	....	
17,000	68,000	.042833	.005166	....	....	
17,500	70,000	.049500	.006667	....	....	
18,000	72,000	.057667	.008167	....	....	
18,500	74,000	.067500	.009833	....	....	
19,000	76,000	.0933	.0258	....	....	
19,500	78,000	.1300	.0367	....	....	
19,660	78,640	.1767	.0467	....	....	Tensile strength.
16,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds..	78,640
Elastic limit per square inch of original section .... do....	42,000
Elongation per inch after rupture .... inch..	.2700
Elongation per inch under strain at elastic limit .... do....	.001400
Reduction in diameter at point of rupture .... do....	.183
Reduction in area after rupture, per centum of original section	54.6
Position of rupture	1″ from neck
Character of broken surface	silky
Elongation of inch sections	″.43*, ″.24, ″.14

No. 736.

Marks, $_{\mathrm{M}}\overset{\mathrm{S}}{\mathrm{T}}\,\overset{\mathrm{T_1}}{\mathrm{M_1}}$,
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000433	.000200	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000733	.000100	0.	....	
7,500	30,000	.000933	.000200	0.	....	
8,750	35,000	.001033	.000100	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001167	.000067	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001300	.000067	....	....	Elastic limit.
10,500	42,000	.006333	.005033	....	....	
10,750	43,000	.006867	.000534	....	....	
11,000	44,000	.007700	.000833	....	....	
11,250	45,000	.008733	.001033	.006933	.006933	
11,500	46,000	.009933	.001200	....	....	
11,750	47,000	.010400	.000467	....	....	
12,000	48,000	.011633	.001233	....	....	
12,250	49,000	.013267	.001634	....	....	
12,500	50,000	.015033	.001766	.012867	.005934	
12,750	51,000	.015433	.000400	....	....	
13,000	52,000	.016300	.000867	....	....	
13,250	53,000	.017333	.001033	....	....	
13,500	54,000	.019000	.001667	....	....	
13,750	55,000	.020333	.001333	....	....	
14,000	56,000	.022033	.001700	....	....	
14,250	57,000	.023500	.001467	....	....	
14,500	58,000	.025367	.001867	....	....	
14,750	59,000	.026767	.001400	....	....	
15,000	60,000	.028833	.002066	....	....	
15,500	62,000	.033000	.004167	....	....	
16,000	64,000	.037167	.004167	....	....	
16,500	66,000	.043833	.006666	....	....	
17,000	68,000	.049333	.005500	....	....	
17,500	70,000	.058000	.008667	....	....	
18,000	72,000	.067333	.009333	....	....	
18,500	74,000	.0933	.025967	....	....	
19,000	76,000	.1100	.0167	....	....	
19,320	77,280	.1700	.0600	....	....	Tensile strength.
16,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77,280
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.42*, ″.19, ″.14

TUBE No. 2.—8″ *Converted Rifle.*

No. 646.

Marks, $\overset{8\;T_2}{B\;T_1\;I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000367	.000200	0.	....	
3,750	15,000	.000533	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000800	.000100	0.	....	
7,500	30,000	.001000	.000200	.000033	.000032	
8,750	35,000	.001133	.000133	....	....	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	Elastic limit.
9,750	39,000	.001367	.000100	....	....	
10,000	40,000	.001667	.000300	.000400	.000367	
10,250	41,000	.001967	.000300	....	....	
10,500	42,000	.002433	.000466	....	....	
10,750	43,000	.004067	.000634	....	....	
11,000	44,000	.005200	.001133	....	....	
11,250	45,000	.006067	.000867	.004533	.004133	
11,500	46,000	.007267	.001200	....	....	
11,750	47,000	.008067	.000800	....	....	
12,000	48,000	.009333	.001266	....	....	
12,250	49,000	.010167	.000834	....	....	
12,500	50,000	.011233	.001066	.009433	.004900	
12,750	51,000	.012067	.000834	....	....	
13,000	52,000	.012833	.000766	....	....	
13,250	53,000	.013867	.001034	....	....	
13,500	54,000	.015333	.001466	....	....	
13,750	55,000	.016600	.001267	....	....	
14,000	56,000	.017600	.001000	....	....	
14,250	57,000	.018933	.001333	....	....	
14,500	58,000	.020233	.001300	....	....	
14,750	59,000	.021400	.001167	....	....	
15,000	60,000	.023167	.001767	....	....	
15,500	62,000	.026167	.003000	....	....	
16,000	64,000	.029067	.002900	....	....	
16,500	66,000	.033600	.004533	....	....	
17,000	68,000	.038333	.004733	....	....	
17,500	70,000	.043733	.005400	....	....	
18,000	72,000	.049933	.006200	....	....	
18,500	74,000	.057500	.007567	....	....	
19,000	76,000	.068067	.010567	....	....	
19,500	78,000	.081333	.013266	....	....	
20,000	80,000	.1000	.018667	....	....	
20,240	80,960	.1500	.0500	....	....	Tensile strength.
17,700	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8569
Hardness		13.33
Tensile strength per square inch of original section	pounds..	80,960
Elastic limit per square inch of original section	do....	38,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.60 from neck, oblique fracture
Character of broken surface		silky
Elongation of inch sections		″.13, ″.14, ″.38*

No. 647.

Marks, ${}^{S\,T_2}_{B\,T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000367	.000234	0.	....	
3,750	15,000	.000533	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
7,750	31,000	.001033	0.	....	....	
8,000	32,000	.001067	.000034	....	....	
8,250	33,000	.001100	.000033	....	....	
8,500	34,000	.001133	.000033	....	....	
8,750	35,000	.001167	.000034	0.	....	
9,000	36,000	.001233	.000066	....	....	
9,250	37,000	.001233	0.	....	....	
9,500	38,000	.001333	.000100	....	....	
9,750	39,000	.001367	.000034	....	....	
10,000	40,000	.001400	.000033	.000100	.000100	
10,250	41,000	.001467	.000067	....	....	Elastic limit.
10,500	42,000	.001733	.000266	....	....	
10,750	43,000	.003500	.001767	....	....	
11,000	44,000	.004433	.000933	....	....	
11,250	45,000	.005300	.000867	.003767	.003667	
11,500	46,000	.006567	.001267	....	....	
11,750	47,000	.007267	.000700	....	....	
12,000	48,000	.008200	.000933	....	....	
12,250	49,000	.009000	.000800	....	....	
12,500	50,000	.010733	.001733	.008933	.005166	
12,750	51,000	.011400	.000667	....	....	
13,000	52,000	.012400	.001000	....	....	
13,250	53,000	.013400	.001000	....	....	
13,500	54,000	.014333	.000933	....	....	
13,750	55,000	.015700	.001367	....	....	
14,000	56,000	.017267	.001567	....	....	
14,250	57,000	.018600	.001333	....	....	
14,500	58,000	.020000	.001400	....	....	
14,750	59,000	.021400	.001400	....	....	
15,000	60,000	.023033	.001633	....	....	
15,500	62,000	.026033	.003000	....	....	
16,000	64,000	.029667	.003634	....	....	
16,500	66,000	.034033	.004366	....	....	
17,000	68,000	.038467	.004434	....	....	
17,500	70,000	.044033	.005566	....	....	
18,000	72,000	.051333	.007300	....	....	
18,500	74,000	.060000	.008667	....	....	
19,000	76,000	.071167	.011167	....	....	
19,500	78,000	.0933	.022132	....	....	
19,950	79,800	.1400	.0467	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,800
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	.2433
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.164000
Reduction in area after rupture, per centum of original section	do....	49.7
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.11, ″.21, ″.41

TESTS OF STRENGTH OF STRUCTURAL MATERIAL.

1.—8-INCH CONVERTED RIFLES.

SPECIMENS FROM STEEL TUBES.

DETAILS OF TESTS.

TUBE No. 1.—8″ *Converted Rifle.*

No. 731.

Marks, $^{8\,T_1}_{B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001000	.000133	0.	....	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001033	0.	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001167	.000067	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001333	.000066	....	....	Elastic limit.
11,250	45,000	.010400	.000067	.008767	.008767	
11,500	46,000	.010933	.000533	....	....	
11,750	47,000	.011433	.000500	....	....	
12,000	48,000	.012867	.001434	....	....	
12,250	49,000	.014167	.001300	....	....	
12,500	50,000	.016100	.001933	.014267	.005500	
12,750	51,000	.016667	.000567	....	....	
13,000	52,000	.018067	.001400	....	....	
13,250	53,000	.019867	.001800	....	....	
13,500	54,000	.021867	.002000	....	....	
13,750	55,000	.024000	.002133	....	....	
14,000	56,000	.025833	.001833	....	....	
14,250	57,000	.026600	.000767	....	....	
14,500	58,000	.028700	.002100	....	....	
14,750	59,000	.030700	.002000	....	....	
15,000	60,000	.033000	.002300	....	....	
15,500	62,000	.039167	.006167	....	....	
16,000	64,000	.044667	.005500	....	....	
16,500	66,000	.051500	.006833	....	....	
17,000	68,000	.060500	.009000	....	....	
17,500	70,000	.073333	.012833	....	....	
18,000	72,000	.1033	.029967	....	....	
18,480	73,920	.1767	.0734	....	....	Tensil strength.
14,600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8607
Hardness		11.81
Tensile strength, per square inch of original section	pounds	73,920
Elastic limit, per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.3000
Elongation per inch under strain at elastic limit	do	.001333
Reduction in diameter at point of rupture	do	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		″.50 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.36*, ″.19

No. 649.

Marks, $^{S\ T^{2}}_{M\ T_{1}\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per in h.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	....	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000467	.000134	0.	....	
5, 000	20, 000	.000667	.000200	0.	....	
6, 250	25, 000	.000800	.000133	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
7, 750	31, 000	.001000	.000033	....	....	
8, 000	32, 000	.001033	.000033	....	....	
8, 250	33, 000	.001067	.000034	....	....	
8, 500	34, 000	.001100	.000033	....	....	
8, 750	35, 000	.001133	.000033	0.	....	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.000033	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001267	.400034	....	....	
10, 000	40, 000	.001300	.000033	0.	....	
10, 250	41, 000	.001300	0.	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001433	.000033	0.	....	
11, 500	46, 000	.001467	.000034	....	....	
11, 750	47, 000	.001567	.000100	....	....	
12, 000	48, 000	.001633	.000066	....	....	
12, 250	40, 000	.001667	.000034	....	....	Elastic limit.
12, 500	50, 000	.002233	.000566	.000633	.000633	
12, 750	51, 000	.002600	.000367	....	....	
13, 000	52, 000	.003167	.000567	....	....	
13, 250	53, 000	.004467	.001300	....	....	
13, 500	54, 000	.005600	.001133	....	....	
13, 750	55, 000	.006500	.000900	.004233	.003600	
14, 000	56, 000	.007433	.000933	....	....	
14, 250	57, 000	.008133	.000700	....	....	
14, 500	58, 000	.009333	.001200	....	....	
14, 750	59, 000	.010833	.001500	....	....	
15, 000	60, 000	.011933	.001100	.009667	.005434	
15, 500	62, 000	.013333	.001400	....	....	
16, 000	64, 000	.016167	.002834	....	....	
16, 500	66, 000	.018667	.002500	....	....	
17, 000	68, 000	.020933	.002266	....	....	
17, 500	70, 000	.023600	.002667	....	....	
18, 000	72, 000	.026833	.003233	....	....	
18, 500	74, 000	.030000	.003167	....	....	
19, 000	76, 000	.033667	.003667	....	....	
19, 500	78, 000	.037667	.004000	....	....	
20, 000	80, 000	.043333	.005666	....	....	
20, 500	82, 000	.045600	.002267	....	....	
21, 000	84, 000	.059500	.013900	....	....	
21, 500	86, 000	.0700	.0105	....	....	
22, 000	88, 000	.0833	.0133	....	....	
22, 260	89, 040	.1333	.0500	....	....	Tensile strength.
19, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8538
Hardness		16.31
Tensile strength per square inch of original section	pounds..	89, 040
Elastic limit per square inch of original section	do....	49, 000
Elongation per inch after rupture	inch..	0.2033
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".70 from neck
Character of broken surface		silky, with granular metal near the circumference
Elongation of inch sections		".11, ".14, ".36

No. 650.

Marks, $\overset{8\,T_3}{M\,T_2\,O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000333	.000200	0.		
3,750	15,000	.000467	.000134	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000767	.000134	0.		
7,500	30,000	.000933	.000166	0.		
7,750	31,000	.000967	.000034			
8,000	32,000	.001000	.000033			
8,250	33,000	.001033	.000033			
8,500	34,000	.001067	.000034			
8,750	35,000	.001100	.000033	0.		
9,000	36,000	.001133	.000033			
9,250	37,000	.001167	.000034			
9,500	38,000	.001200	.000033			
9,750	39,000	.001233	.000033			
10,000	40,000	.001267	.000034	0.		
10,250	41,000	.001300	.000033			
10,500	42,000	.001367	.000067			
10,750	43,000	.001400	.000033			
11,000	44,000	.001433	.000033			Elastic limit.
11,250	45,000	.004867	.003434	.003233	.003233	
11,500	46,000	.005733	.000866			
11,750	47,000	.006100	.000367			
12,000	48,000	.007000	.000900			
12,250	29,000	.007967	.000967			
12,500	50,000	.009633	.001666	.007733	.004500	
12,750	51,000	.010400	.000767			
13,000	52,000	.011367	.000967			
13,250	53,000	.012700	.001333			
13,500	54,000	.013433	.000733			
13,750	55,000	.014800	.001367	.012667	.004934	
14,000	56,000	.016600	.001800			
14,250	57,000	.017267	.000667			
14,500	58,000	.018333	.001066			
14,750	59,000	.019867	.001534			
13,000	60,000	.021067	.001800	.019267	.006600	
15,500	62,000	.023100	.001433			
16,000	64,000	.028000	.004900			
16,500	66,000	.031833	.003833			
17,000	68,000	,035933	.004100			
17,500	*70,000	.040067	.004134			
18,000	72,000	.046500	.006433			
18,500	74,000	.053333	.006833			
19,000	76,000	.063167	.009834			
19,500	78,000	.076333	.013166			
20,000	80,000	.098167	.011834			
20,420	81,680	.1633	.065133			Tensile strength.
17,200						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81,680
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2633
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1'' from neck
Character of broken surface		silky
Elongation of inch sections		''.15, ''.23, ''.41*

No. 651.

Marks, $^{\text{8T2}}_{\text{M T3 M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000900	.000233	0.	....	
7,500	30,000	.001100	.000200	0.	....	
7,750	31,000	.001100	.0	....	....	
8,000	32,000	.001133	.000033	....	....	
8,250	33,000	.001167	.000034	....	....	
8,500	34,000	.001200	.000033	....	....	
8,750	35,000	.001233	.000033	0.	....	
9,000	36,000	.001267	.000034	....	....	
9,250	37,000	.001300	.000033	....	....	
9,500	38,000	.001367	.000067	....	....	
9,750	39,000	.001400	.000033	....	....	
10,000	40,000	.001433	.000033	.000033	.000033	
10,250	41,000	.001433	0.	....	....	
10,500	42,000	.001500	.000067	....	....	
10,750	43,000	.001567	.000067	....	....	
11,000	44,000	.001633	.000066	....	....	
11,250	45,000	.001667	.000034	.000133	.000100	
11,500	46,000	.001700	.000033	....	....	
11,750	47,000	.001767	.000067	....	....	Elastic limit.
12,000	48,000	.001933	.000166	....	....	
12,250	49,000	.002133	,000200	....	....	
12,500	50,000	.003033	.000900	.001267	.001134	
12,750	51,000	.003467	.000434	....	....	
13,000	52,000	.004433	.000966	....	....	
13,250	53,000	.005233	.000800	....	....	
13,500	54,000	.006433	.001200	....	....	
13,750	55,000	.007067	.000634	.005133	.003866	
14,000	56,000	.008433	.001366	....	....	
14,250	57,000	.009033	.000600	....	....	
14,500	58,000	.009900	.000867	....	....	
14,750	59,000	.010767	.000867	....	....	
15,000	60,000	.012500	.001733	.010167	.005034	
15,500	62,000	.013733	.001233	....	....	
16,000	64,000	.016067	.002334	....	....	
16,500	66,000	.018367	.002300	....	....	
17,000	68,000	.021367	.003000	....	....	
17,500	70,000	.023400	.002033	....	....	
18,000	72,000	.026667	.003267	....	....	
18,500	74,000	.030333	.003666	....	....	
19,000	76,000	.034667	.004334	....	....	
19,500	78,000	.038233	.003566	....	....	
20,000	80,000	.041833	.003600	....	....	
20,500	82,000	.047600	.005767	....	....	
21,000	84,000	.053333	.005733	....	....	
21,500	86,000	.064667	.011334	....	....	
22,000	88,000	.0800	.015333	....	....	
22,500	90,000	.1100	.0300	....	....	
22,540	90,160	.1467	.0317	....	....	Tensile strength,
19,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	90,160
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.85 from neck
Character of broken surface		silky, with granulation near circumference
Elongation of inch sections		″.10, ″.15, ″.35

TUBE No. 3.—8″ *Converted Rifle.*

No. 802.

Marks, $\overset{8\,T_3}{B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000500	.000233	0.	....	
5,000	20,000	.000633	.000133	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001267	.000067	.000033	.000033	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	Elastic limit.
11,000	44,000	.002600	.001233	....	....	
11,250	45,000	.004800	.002200	.003333	.003300	
11,500	46,000	.007033	.002233	....	....	
11,750	47,000	.007700	.000667	....	....	
12,000	48,000	.008867	.001167	....	....	
12,250	49,000	.010000	.001133	....	....	
12,500	50,000	.011067	.001067	.009367	.006034	
12,750	51,000	.011700	.000633	....	....	
13,000	52,000	.012833	.001133	....	....	
13,250	53,000	.014067	.001234	....	....	
13,500	54,000	.015700	.001633	....	....	
13,750	55,000	.016867	.001167	....	....	
14,000	56,000	.018333	.001466	....	....	
14,250	57,000	.020000	.001667	....	....	
14,500	58,000	.021400	.001400	....	....	
14,750	59,000	.022833	.001433	....	....	
15,000	60,000	.024533	.001700	....	....	
15,500	62,000	.028267	.001734	....	....	
16,000	64,000	.032100	.003833	....	....	
16,500	66,000	.037000	.004900	....	....	
17,000	68,000	.042000	.005000	....	....	
17,500	70,000	.048000	.006000	....	....	
18,000	72,000	.055033	.007033	....	....	
18,500	74,000	.064833	.009800	....	....	
19,000	76,000	.079167	.014334	....	....	
19,500	78,000	.1000	.020833	....	....	
19,840	79,360	.1600	.0600	....	....	Tensile strength.
17,930	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8625
Hardness		11.81
Tensile strength per square inch of original section	pounds	79,360
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.6 from middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		″.25, ″.28*, ″14

No. 803.

Marks, $\substack{8\ T\ 13 \\ B\ T\ 1\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000167	.000167	0.	....	Initial load.
2,500	10,000	.000300	.000133	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	.000033	.000033	
7,500	30,000	.000967	.000167	.000033	0.	
8,750	35,000	.001100	.000133	.000033	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	.000033	0.	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	Elastic limit.
10,750	43,000	.002500	.001167	....	....	
11,000	44,000	.003500	.001000	....	....	
11,250	45,000	.004700	.001200	.003167	.003134	
11,500	46,000	.005933	.001233	....	....	
11,750	47,000	.006567	.000634	....	....	
12,000	48,000	.007500	.000933	....	....	
12,250	49,000	.008333	.000833	....	....	
12,500	50,000	.009400	.001067	.007567	.004400	
12,750	51,000	.010000	.000600	....	....	
13,000	52,000	.011333	.001333	....	....	
13,250	53,000	.012333	.001000	....	....	
13,500	54,000	.013500	.001167	....	....	
13,750	55,000	.014500	.001000	....	....	
14,000	56,000	.015833	.001333	....	....	
14,250	57,000	.017300	.001467	....	....	
14,500	58,000	.018567	.001267	....	....	
14,750	59,000	.019733	.001166	....	....	
15,000	60,000	.021333	.001600	....	....	
15,500	62,000	.024433	.003100	....	....	
16,000	64,000	.027667	.003234	....	....	
16,500	66,000	.031333	.003666	....	....	
17,000	68,000	.035600	.004267	....	....	
17,500	70,000	.040333	004733	....	....	
18,000	72,000	.045667	.005334	....	....	
18,500	74,000	.052667	.007000	....	....	
19,000	76,000	.061667	.009000	....	....	
19,500	78,000	.073667	.012000	....	....	
20,000	80,000	.093000	.019333	....	....	
20,220	80,880	.1300	.0370	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,880
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".9 from neck
Character of broken surface		silky
Elongation of inch sections		".39*, ".12, ".08

No. 804.

Marks, $B\,\overset{8\,T_3}{T_3}\,M$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	.000033	.000033	
6, 250	25, 000	.000800	.000200	.000033	0.	
7, 500	30, 000	.000967	.000167	.000033	0.	
8, 750	35, 000	.001100	.000133	.000033	0.	
9, 000	36, 000	.001100	0.	....	....	
9, 250	37, 000	.001167	.000067	....	....	
9, 500	38, 000	.001233	.000066	....	....	
9, 750	39, 000	.001267	.000034	....	....	
10, 000	40, 000	.001300	.000033	.000100	.000067	Elastic limit.
10, 250	41, 000	.006633	.005333	....	....	
10, 500	42, 000	.007400	.000767	....	....	
10, 750	43, 000	.008367	.000967	....	....	
11, 000	44, 000	.009400	.001033	....	....	
11, 250	45, 000	.010233	.000833	.008567	.008467	
11, 500	46, 000	.011767	.001534	....	....	
11, 750	47, 000	.012400	.000633	....	....	
12, 000	48, 000	.013600	.001200	....	....	
12, 250	49, 000	.014767	.001167	....	....	
12, 500	50, 000	.016333	.001566	.014300	.005733	
12, 750	51, 000	.017267	.000934	....	....	
13, 000	52, 000	.018567	.001300	....	....	
13, 250	53, 000	.020233	.001666	....	....	
13, 500	54, 000	.022067	.001834	....	....	
13, 750	55, 000	.023600	.001533	....	....	
14, 000	56, 000	.025333	.001733	....	....	
14, 250	57, 000	.026667	.001334	....	....	
14, 500	58, 000	.028700	.002033	....	....	
14, 750	59, 000	.030633	.001933	....	....	
15, 000	60, 000	.033000	.002367	....	....	
15, 500	62, 000	.037367	.004367	....	....	
16, 000	64, 000	.043167	.005800	....	....	
16, 500	66, 000	.049333	.006166	....	....	
17, 000	68, 000	.056333	.007000	....	....	
17, 500	70, 000	.066167	.009834	....	....	
18, 000	72, 000	.079667	.013500	....	....	
18, 500	74, 000	.1033	.023633	....	....	
18, 910	75, 640	.1600	.0567	....	....	Tensile strength.
15, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	75, 640
Elastic limit per square inch of original section	do....	40, 000
Elongation per inch after rupture	inch..	0. 2500
Elongation per inch under strain at elastic limit	do...	.001300
Reduction in diameter at point of rupture	do...	.173
Reduction in area after rupture, per centum of original section	do...	52. 2
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.43*, ″.20, ″.12

No. 805.

Marks, $^{8\ T_3}_{M\ T_1\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000033	.000033	0.	....	
2, 500	10, 000	.000200	.000167	0.	....	
3, 750	15, 000	.000300	.000100	.000033	.000033	
5, 000	20, 000	.000467	.000167	.000033	0.	
6, 250	25, 000	.000633	.000166	.000033	0.	
7, 500	30, 000	.000800	.000167	.000033	0.	
8, 750	35, 000	.000967	.000167	.000033	0.	
9, 000	36, 000	.000967	0.	....	....	
9, 250	37, 000	.001000	.000033	....	....	
9, 500	38, 000	.001033	.000033	....	....	
9, 750	39, 000	.001067	.000034	....	....	
10, 000	40, 000	.001100	.000033	.000033	0.	
10, 250	41, 000	.001133	.000033	....	....	
10, 500	42, 000	.001167	.000034	....	....	
10, 750	43, 000	.001200	.000033	....	....	
11, 000	44, 000	.001267	.000067	....	....	Elastic limit.
11, 250	45, 000	.001583	.000266	.000167	.000200	
11, 500	46, 000	.002133	.000600	....	....	
11, 750	47, 000	.003200	.001067	....	....	
12, 000	48, 000	.005333	.002133	....	....	
12, 250	49, 000	.006000	.000667	....	....	
12, 500	50, 000	.006700	.000700	.004933	.004766	
12, 750	51, 000	.007400	.000700	....	....	
13, 000	52, 000	.008300	.000900	....	....	
13, 250	53, 000	.009333	.001033	....	....	
13, 500	54, 000	.010400	.001067	....	....	
13, 750	55, 000	.011500	.001100	....	....	
14, 000	56, 000	.012500	.001000	....	....	
14, 250	57, 000	.013500	.001000	....	....	
14, 500	58, 000	.014700	.001200	....	....	
14, 750	59, 000	.015667	.000967	....	....	
15, 000	60, 000	.017067	.001400	....	....	
15, 500	62, 000	.019633	.002566	....	....	
16, 000	64, 000	.022333	.002700	....	....	
16, 500	66, 000	.025667	.003334	....	....	
17, 000	68, 000	.028933	.003266	....	....	
17, 500	70, 000	.032333	.003400	....	....	
18, 000	72, 000	.036667	.004334	....	....	
18, 500	74, 000	.041333	.004666	....	....	
19, 000	76, 000	.046167	.004834	....	....	
19, 500	78, 000	.053000	.006833	....	....	
20, 000	80, 000	.061167	.008167	....	....	
20, 500	82, 000	.073000	.011833	....	....	
21, 000	84, 000	.0967	.0237	....	....	
21, 440	85, 760	.1367	.0400	....	....	Tensile strength.
19, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8551
Hardness		18. 46
Tensile strength per square inch of original section	pounds..	85, 760
Elastic limit per square inch of original section	do....	44, 000
Elongation per inch after rupture	inch..	0. 2033
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		".7 from necy
Character of broken surface		silkl
Elongation of inch sections		".36*, ".14, ".1k

No. 806.

Marks, $\overset{S\,T_3}{M\,T_3\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000038	
2,500	10,000	.000300	.000133	.000033	0.	
3,750	15,000	.000467	.000167	.000033	0.	
5,000	20,000	.000633	.000166	.000033	0.	
6,250	25,000	000800	.000167	.000033	0.	
7,500	30,000	.000967	.000167	.000033	0.	
8,750	35,000	.001167	.000200	.000067	.000034	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000067	0.	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	Elastic limit.
11,000	44,000	.003400	.001967	....	....	
11,250	45,000	.006067	.002667	.004600	.004533	
11,500	46,000	.007067	.001000	....	....	
11,750	47,000	.007700	.000633	....	....	
12,000	48,000	.008933	.001233	....	....	
12,250	49,000	.010000	.001067	....	....	
12,500	50,000	.011067	.001067	.009567	.004967	
12,750	51,000	.011833	.000766	....	....	
13,000	52,000	.012400	.000567	....	....	
13,250	53,000	.013467	.001067	....	....	
13,500	54,000	.014833	.001366	....	....	
13,750	55,000	.016000	.001167	....	....	
14,000	56,000	.017467	.001467	....	....	
14,250	57,000	.018733	.001266	....	....	
14,500	58,000	.020100	.001367	....	....	
14,750	59,000	.021400	.001300	....	....	
15,000	60,000	.022900	.001500	....	....	
15,500	62,000	.026000	.003100	....	....	
16,000	64,000	.029033	.003333	....	....	
16,500	66,000	.033333	.004000	....	....	
17,000	68,000	.037367	.004034	....	....	
17,500	70,000	.042667	.005300	....	....	
18,000	72,000	.048667	.006000	....	....	
18,500	74,000	.055167	.006500	....	....	
19,000	76,000	.064000	.008833	....	....	
19,500	78,000	.077500	.0135	....	....	
20,000	80,000	.1033	.0258	....	....	
20,470	81,880	.1600	.0567	....	....	Tensile strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	81,880
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.2367
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.9 from neck
Character of broken surface		silky
Elongation of inch sections		″.40, ″.18, ″.13

No. 807.

Marks, $^{S\,T_1}_{M\,T_1M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000300	.000200	0.	....	
3, 750	15, 000	.000433	.000133	0.	....	
5, 000	20, 000	.000633	.000200	0.	....	
6, 250	25, 000	.000767	.000134	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	.000033	.000033	
9, 000	36, 000	.001100	0.	....	....	
9, 250	37, 000	.001133	.000033	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001200	.000033	....	....	
10, 000	40, 000	.001233	.000033	.000033	0.	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001367	.000034	....	....	
11, 250	45. 000	.001400	.000033	0. 000033	0.	
11, 500	46, 000	.001500	.000100	....	....	Elastic limit.
11, 750	47, 000	.003767	.002267	....	....	
12, 000	48, 000	.006067	.002300	....	....	
12, 250	49. 000	.007333	.001266	....	....	
12, 500	50, 600	.008267	.000934	.006400	.006367	
12, 750	51, 000	.008933	.000666	....	....	
13, 000	52, 000	.009567	.000634	....	....	
13, 250	53, 000	.010567	.001000	....	....	
13, 500	54, 000	.012000	.001433	....	....	
13, 750	55, 000	.013067	.001067	....	....	
14, 000	56, 000	.014600	.001533	....	....	
14, 250	57, 000	.015933	.001333	....	....	
14, 500	58, 000	.017067	.001134	....	....	
14, 750	59, 000	.018267	.001200	....	....	
15, 000	60, 000	.019567	.001300	....	....	
15, 500	62, 000	.022267	.002700	....	....	
16, 000	64, 000	.025567	.003300	....	....	
16, 500	66, 000	.029567	.004000	....	....	
17, 000	68, 000	.034333	.004766	....	....	
17, 500	70, 000	.038333	.004000	....	....	
18, 000	72, 000	.043000	.004667	....	....	
18, 500	74, 000	.048000	.005000	....	....	
19, 000	76, 000	.055833	.007833	....	....	
19, 500	78, 000	.068333	.012500	....	....	
20, 000	80, 000	.0800	.011667	....	....	
20, 500	82, 000	.1067	.0267	....	....	
20, 700	82, 800	.1633	.0566	....	....	Tensile strength.
17, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82, 800
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0. 2733
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section	do ...	52.2
Position of rupture		".5 from middle of stem.
Character of broken surface		silky
Elongation of inch sections		".23, ".42*, ".17

TUBE No. 4.—8″ *Converted Rifle.*

No. 668.

Marks, $^{8\ T_4}_{B\ T_1}$ I.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	.0	.0	.0	.0	Initial load.
1, 250	5, 000	.000100	.000100	.0	....	
2, 500	10, 000	.000300	.000200	.0	....	
3, 750	15, 000	.000533	.000233	.0	....	
5, 000	20, 000	.000667	.000134	.000033	.000033	
6, 250	25, 000	.000833	.000166	.000033	.0	
7, 500	30, 000	.001000	.000167	.000033	.0	
7, 750	31, 000	.001033	.000033	....	....	
8, 000	32, 000	.001033	.0	....	....	
8, 250	33, 000	.001067	.000034	....	....	
8, 500	34, 000	.001100	.000033	....	....	
8, 750	35, 000	.001133	.000033	.000033	.0	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.001200	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001267	.000034	....	....	
10, 000	40, 000	.001300	.000033	.000033	.0	
10, 250	41, 000	.001333	.000033	....	....	
10, 500	42, 000	.001367	.000034	....	....	
10, 750	43, 000	.001400	.000033	....	....	
11, 000	44, 000	.001433	.000033	....	....	
11, 250	45, 000	.001467	.000034	.000033	.0	
11, 500	46, 000	.001500	.000033	....	....	Elastic limit.
11, 750	47, 000	.002467	.000967	....	....	
12, 000	48, 000	.003333	.000867	....	....	
12, 250	49, 000	.004200	.000867	....	....	
12, 500	50, 000	.006000	.001800	.004267	.004234	
12, 750	51. 000	.007033	.001033	....	....	
13, 000	52, 000	.008033	.001000	....	....	
13, 250	53, 000	.008833	.000800	....	....	
13, 500	54, 000	.010333	.001500	....	....	
13, 750	55, 000	.011333	.001000	.009367	.005100	
14, 000	56, 000	.012667	.001334	....	....	
14, 250	57, 000	.013667	.001000	....	....	
14, 500	58, 000	.015000	.001333	....	....	
14, 750	59, 000	.015933	.000933	....	....	
15, 000	60, 000	.017500	.001567	.015133	.005766	
15, 500	62, 000	.020367	.002867	....	....	
16, 000	64, 000	.022667	.002300	....	....	
16, 500	66, 000	.026800	.003933	....	....	
17, 000	68, 000	.030667	.004067	....	....	
17, 500	70, 000	.034033	.003366	....	....	
18, 000	72, 000	.038667	.004634	....	....	
18, 500	74, 000	.044400	.005733	....	....	
19, 000	76, 000	.050700	.006300	....	....	
19, 500	78, 000	.059333	.008633	....	....	
20, 000	80, 000	.070167	.010834	....	....	
20, 500	82, 000	.090000	.019833	....	....	
20, 780	83, 120	.1300	.0400	....	....	Tensile strength.
18, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7. 8563
Hardness	14. 38
Tensile strength per square inch of original section ...pounds..	83, 120
Elastic limit per square inch of original section ...do....	46, 000
Elongation per inch after rupture ...inch..	0. 2000
Elongation per inch under strain at elastic limit ...do....	.001500
Reduction in diameter at point of rupture ...do....	.154
Reduction in area after rupture, per centum of original section	47. 2
Position of rupture	″.65 from neck
Character of broken surface	silky
Elongation of inch sections	″.38*, ″.12, ″.10

No. 669.

Marks, $\overset{8\,T_4}{B\,T_7O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	
1, 250	5, 000	. 000100	. 000100	0.	....	Initial load.
2, 500	10, 000	. 000233	. 000133	0.	....	
3, 750	15, 000	. 000367	. 000134	0.	....	
5, 000	20, 000	. 000583	. 000166	0.	....	
6, 250	25, 000	. 000700	. 000167	0.	....	
7, 500	30, 000	. 000867	. 000167	0.	....	
8, 750	35, 000	. 001033	. 000166	0.	....	
10, 000	40, 000	. 001200	. 000167	0.	....	
10, 250	41, 000	. 001233	. 000033	....	....	
10, 500	42, 000	. 001233	0.	....	....	
20, 750	43, 000	. 001267	. 000034	....	....	
11, 000	44, 000	. 001300	. 000033	....	....	
11, 250	45, 000	. 001333	. 000033	0.	....	
11, 500	46, 000	. 001367	. 000034	....	....	
11, 750	47, 000	. 001400	. 000033	....	....	
12, 000	48, 000	. 001433	. 000033	....	....	
12, 250	49, 000	. 001467	. 000034	....	....	Elastic limit,
12, 500	50, 000	. 003067	. 001600	. 001367	. 001367	
12, 750	51, 000	. 003900	. 000833	....	....	
13, 060	52, 000	. 005300	. 001400	....	....	
13, 250	53, 000	. 006500	. 001200	....	....	
13, 500	54, 000	. 006900	. 000400	....	....	
13, 750	55, 000	. 007500	. 000600	. 005633	. 004266	
14, 000	56, 000	. 008333	. 000833	....	....	
14, 250	57, 000	. 008933	. 000600	....	....	
14, 500	58, 000	. 010200	. 001267	....	....	
14, 730	59, 000	. 011333	. 001133	....	....	
15, 000	60, 000	. 012367	. 001034	. 010233	. 004600	
15, 500	62, 000	. 014700	. 002333	....	....	
16, 000	64, 000	. 016900	. 002200	....	....	
16, 500	66, 000	. 019333	. 002433	....	....	
17, 000	68, 000	. 021967	. 002634	....	....	
17, 500	70, 000	. 024933	. 002966	....	....	
18, 000	72, 000	. 027967	. 003034	....	....	
18, 500	74, 000	. 031333	. 003366	....	....	
19, 000	76, 000	. 035033	. 003700	....	....	
19, 500	78, 000	. 039100	. 004067	....	....	
20, 000	80, 000	. 043833	. 004733	....	....	
20, 500	82, 000	. 051367	. 007534	....	....	
21, 000	84, 000	. 058333	. 006966	....	....	
21, 500	86, 000	. 068500	. 010167	....	....	
22, 000	88, 000	. 0867	. 0182	....	....	
22, 370	89, 480	. 1267	. 0400	....	....	Tensile strength.
19, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	89, 480
Elastic limit per square inch of original section	do	49, 000
Elongation per inch after rupture	inch	0. 2133
Elongation per inch under strain at elastic limit	do	. 001467
Reduction in diameter at point of rupture	do	. 154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″. 35*, ″. 16, ″. 13

No. 670.

Marks, $_{B}\overset{8\,T_4}{T_3}M$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000583	.000200	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000833	.000133	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001100	.000100	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001233	.000100	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000100	.000100	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001500	.000033	.000200	.000100	Elastic limit.
11,500	46,000	.003700	.002200	....	....	
11,750	47,000	.004433	.000733	....	....	
12,000	48,000	.005700	.001267	....	....	
12,250	49,000	.006400	.000700	....	....	
12,500	50,000	.007333	.000933	.005600	.005400	
12,750	51,000	.008000	.000667	....	....	10′ rest under load.
13,000	52,000	.010133	.002133	....	....	
13,250	53,000	.010333	.000200	....	....	
13,500	54,000	.010733	.000400	....	....	
13,750	55,000	.012000	.001267	.010333	.004733	
14,000	56,000	.013733	.001733	....	....	
14,250	57,000	.014433	.000700	....	....	
14,500	58,000	.015233	.000800	....	....	
14,750	59,000	.016333	.001100	....	....	
15,000	60,000	.017700	.001367	.015433	.005100	
15,500	62,000	.020167	.002467	....	....	
16,000	64,000	.023000	.002833	....	....	
16,500	66,000	.026033	.003033	....	....	
17,000	68,000	.029500	.003467	....	....	
17,500	70,000	.033133	.003633	....	....	
18,000	72,000	.037233	.004100	....	....	
18,500	74,000	.042000	.004767	....	....	
19,000	76,000	.047367	.005367	....	....	
19,500	78,000	.053933	.006566	....	....	
20,000	80,000	.062333	.008400	....	....	
20,500	82,000	.074000	.011667	....	....	
21,000	84,000	.093667	.019667	....	....	
21,340	85,360	.1400	.046333	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85,360
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.10 from neck
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.23, ″.11

No. 671.

Marks, $\overset{8\,T_4}{M\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001033	.000100	0.	....	
10,000	40,000	.001233	.000200	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001567	.000067	....	....	
12,500	50,000	.001600	.000033	0.	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	Elastic limit.
13,250	53,000	.002533	.000866	....	....	
13,500	54,000	.003100	.000567	....	....	
13,750	55,000	.004133	.001033	.002467	.002467	
14,000	56,000	.005833	.001700	....	....	
14,250	57,000	.006733	.000900	....	....	
14,500	58,000	.008000	.001267	....	....	
14,750	59,000	.009033	.001033	....	....	
15,000	60,000	.010333	.001300	.008167	.005700	
15,500	62,000	.012100	.001767	....	....	
16,000	64,000	.014083	.001983	....	....	
16,500	66,000	.016667	.002584	....	....	
17,000	68,000	.019667	.003000	....	....	
17,500	70,000	.022433	.002766	....	....	
18,000	72,000	.025500	.003067	....	....	
18,500	74,000	.028367	.002867	....	....	
19,000	76,000	.032333	.002966	....	....	
19,500	78,000	.036333	.004000	....	....	
20,000	80,000	.040667	.004334	....	....	
20,500	82,000	.046167	.005500	....	....	
21,000	84,000	.053333	.007166	....	....	
21,500	86,000	.063167	.009834	....	....	
22,000	88,000	.076167	.013000	....	....	
22,500	90,000	.1067	.030583	....	....	Tensile strength.
19,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8546
Hardness		16.23
Tensile strength per square inch of original section	pounds..	90,000
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.35*, ″.10, ″.10

No. 672.

Marks, $\overset{8\ T_4}{M\ T_3\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	.000067	.000067	
7,500	30,000	.001033	.000166	.000067	0.	
8,750	35,000	.001200	.000167	.000100	.000033	
10,000	40,000	.001367	.000167	.000133	.000033	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	.000133	0.	
11,500	46,000	.001600	.000067	....	....	
11,750	47,000	.001667	.000067	....	....	Elastic limit.
12,000	48,000	.005467	.003800	....	....	
12,250	49,000	.001767	.001300	....	....	
12,500	50,000	.008467	.001700	.006600	.006467	
12,750	51,000	.008933	.000466	....	....	
13,000	52,000	.009433	.000500	....	....	
13,250	53,000	.009933	.000500	....	....	
13,500	54,000	.011333	.001400	....	....	
13,750	55,000	.012633	.001300	.010667	.004067	
14,000	56,000	.013400	.000767	....	....	
14,250	57,000	.014000	.000600	....	....	
14,500	58,000	.015367	.001367	....	....	
14,750	59,000	.016767	.001400	....	....	
15,000	60,000	.018400	.001633	.016067	.005400	
15,500	62,000	.020000	.001600	....	....	
16,000	64,000	.023167	.003167	....	....	
16,500	66,000	.027333	.004166	....	....	
17,000	68,000	.030233	.002800	....	....	
17,500	70,000	.033000	.002767	....	....	
18,000	72,000	.038367	.005367	....	....	
18,500	74,000	.043267	.004900	....	....	
19,000	76,000	.047700	.004433	....	....	
19,500	78,000	.054167	.006467	....	....	
20,000	80,000	.064400	.010233	....	....	
20,500	82,000	.075500	.011100	....	....	
21,000	84,000	.095867	.020367	....	....	
21,300	85,200	.1400	.044133	....	....	Tensile strength.
19,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85,200
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2133
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.36*, ″.16, ″.12

No. 673.

Marks, $\mathrm{M}\overset{8\,\mathrm{T}_4}{\mathrm{T}_3}\mathrm{M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	.000067	.000067	
2,500	10,000	.000367	.000134	.000067	0.	
3,750	15,000	.000567	.000200	.000067	0.	
5,000	20,000	.000700	.000133	.000067	0.	
6,250	25,000	.000867	.000167	.000100	.000033	
7,500	30,000	.001033	.000166	.000100	0.	
8,750	35,000	.001200	.000167	.000100	0.	
10,000	40,000	.001367	.000167	.000100	0.	
10,250	41,000	.001367	0.	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001500	.000067	....	....	
11,250	45,000	.001567	.000067	.000133	.000033	
11,500	46,000	.001600	.000033	....	....	
11,750	47,000	.001633	.000033	....	....	Elastic limit.
12,000	48,000	.007500	.005867	....	....	
12,250	49,000	.008233	.000733	....	....	
12,500	50,000	.009700	.001467	.007833	.007700	
12,750	51,000	.010200	.000500	....	....	
13,000	52,000	.011033	.000833	....	....	
13,250	53,000	.012067	.001034	....	....	
13,500	54,000	.013167	.001100	....	....	
13,750	55,000	.014133	.000966	.012067	.004234	
14,000	56,000	.016033	.001900	....	....	
14,250	57,000	.016733	.000700	....	....	
14,500	58,000	.018100	.001367	....	....	
14,750	59,000	.019000	.000900	....	....	
15,000	60,000	.020667	.001667	.018333	.006266	
15,500	62,000	.023000	.002333	....	....	
16,000	64,000	.026767	.003767	....	....	
16,500	66,000	.030000	.003233	....	....	
17,000	68,000	.034000	.004000	....	....	
17,500	70,000	.038667	.004667	....	....	
18,000	72,000	.043500	.004833	....	....	
18,500	74,000	.050167	.006667	....	....	
19,000	76,000	.057000	.006833	....	....	
19,500	78,000	.068000	.011000	....	....	
20,000	80,000	.081000	.013000	....	....	
20,500	82,000	.1100	.0290	....	....	
20,800	83,200	.1733	.0633	....	....	Tensile strength.
17,800	....	....	....	....	....	Load at time of rupture.

General summary.

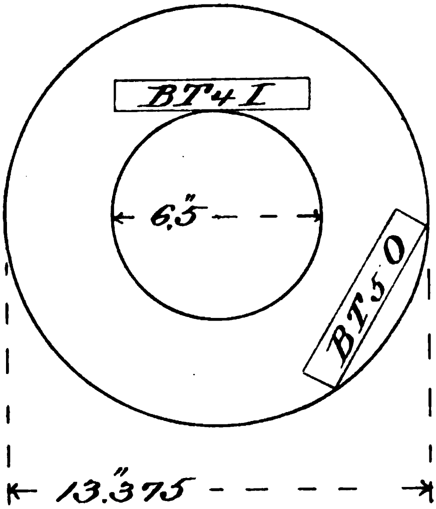
Tensile strength per square inch of original section	pounds	83,200
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.2533
Elongation per inch under strain at elastic limit	do	.001633
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.8 from neck
Character of broken surface		silky
Elongation of inch sections		″.43*, ″.20, ″.13

8" Converted Rifle.

Tube No. 4.

Additional specimens

Breech



S Ex 36 49 1

No. 748.

Marks, $^{8\,T_4}_{B\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001033	.000200	0.	....	
8,750	35,000	.001167	.000134	0.	....	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	0.	....	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	Elastic limit.
11,250	45,000	.003333	.001866	.001633	.001633	
11,500	46,000	.005533	.002200	....	....	
11,750	47,000	.006233	.000700	....	....	
12,000	48,000	.007700	.001467	....	....	
12,250	49,000	.008433	.000733	....	....	
12,500	50,000	.009500	.001067	.007467	.005834	
12,750	51,000	.010267	.000767	....	....	
13,000	52,000	.011667	.001400	....	....	
13,250	53,000	.012667	.001000	....	....	
13,500	54,000	.014133	.001466	....	....	
13,750	55,000	.015200	.001067	....	....	
14,000	56,000	.017000	.001800	....	....	
14,250	57,000	.018167	.001167	....	....	
14,500	58,000	.019600	.001433	....	....	
14,750	59,000	.020700	.001100	....	....	
15,000	60,000	.022600	.001900	....	....	
15,500	62,000	.026034	.003433	....	....	
16,000	64,000	.029600	.003567	....	....	
16,500	66,000	.033733	.004133	....	....	
17,000	68,000	.038833	.005100	....	....	
17,500	70,000	.043733	.004900	....	....	
18,000	72,000	.051333	.007600	....	....	
18,500	74,000	.059367	.008034	....	....	
19,000	76,000	.071667	.012300	....	....	
19,500	78,000	.1000	.028333	....	....	
19,800	79,200	.1533	.0533	....	....	Tensile strength.
16,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....pounds..	79,200
Elastic limit per square inch of original section....do....	44,000
Elongation per inch after rupture....inch..	0.2400
Elongation per inch under strain at elastic limit....do....	.001467
Reduction in diameter at point of rupture....do....	.174
Reduction in area after rupture, per centum of original section....	52.2
Position of rupture....	″.85 from neck
Character of broken surface....	silky
Elongation of inch sections....	″.18, ″.18, ″.41*

No. 749.

Marks, $^{8T_4}_{BT^5O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000533	.000200	0.		
5,000	20,000	.000700	.000167	0.		
6,250	25,000	.000900	.000200	0.		
7,500	30,000	.001033	.000133	0.		
8,750	35,000	.001200	.000167	0.		
9,000	36,000	.001233	.000033			
9,250	37,000	.001267	.000034			
9,500	38,000	.001300	.000033			
9,750	39,000	.001333	.000033			
10,000	40,000	.001367	.000034	0.		
10,250	41,000	.001400	.000033			
10,500	42,000	.001433	.000033			
10,750	43,000	.001467	.000034			
11,000	44,000	.001533	.000066			Elastic limit.
11,250	45,000	.005467	.003934	.003700	.003700	
11,500	46,000	.006400	.000933			
11,750	47,000	.007067	.000667			
12,000	48,000	.008267	.001200			
12,250	49,000	.009267	.001000			
12,500	50,000	.010800	.001533	.008800	.005100	
12,750	51,000	.011367	.000567			
13,000	52,000	.012333	.000966			
13,250	53,000	.013500	.001167			
13,500	54,000	.014933	.001433			
13,750	55,000	.016067	.001134			
14,000	56,000	.017467	.001400			
14,250	57,000	.018667	.001200			
14,500	58,000	.020400	.001733			
14,750	59,000	.021533	.001133			
15,000	60,000	.023333	.001800			
15,500	62,000	.026767	.003434			
16,000	64,000	.030400	.003633			
16,500	66,000	.034333	.003933			
17,000	68,000	.040167	.005834			
17,500	70,000	.046333	.006166			
18,000	72,000	.053000	.006667			
18,500	74,000	.062167	.009167			
19,000	76,000	.075667	.013500			
19,500	78,000	.1033	.027633			
19,780	79,120	.1633	.0600			Tensile strength.
17,300						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	79,120
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2467
Elongation per inch under strain at elastic limit	do	.001533
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1".1 from neck, oblique
Character of broken surface		silky
Elongation of inch sections		".14, ".23, ".37*

TUBE No. 5.—8″ *Converted Rifle.*

No. 693.

Marks, $\overset{8\ \mathrm{T}_{5}}{\mathrm{B\ T_{1}\ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001233	.000200	.000033	.000033	
10,250	41,000	.001367 .001767	.000134 .000400	....	....	Elastic limit.
10,500	42,000	.002167	.000400	....	....	
10,750	43,000	.002500	.000333	....	....	
11,000	44,000	.003467	.000967	....	....	
11,250	45,000	.004533	.001066	.003133	.003100	
11,500	46,000	.006233	.001700	....	....	
11,750	47,000	.006633	.000400	....	....	
12,000	48,000	.007933	.001300	....	....	
12,250	49,000	.008833	.000900	....	....	
12,500	50,000	.010000	.001167	.008207	.005134	
12,750	51,000	.010733	.000733	....	....	
13,000	52,000	.012000	.001267	....	....	
13,250	53,000	.013033	.001033	....	....	
13,500	54,000	.014067	.001034	.013333	.005066	
13,750	55,000	.015400	.001333	....	....	
14,000	56,000	.016600	.001200	....	....	
14,250	57,000	.017500	.000900	....	....	
14,500	58,000	.019333	.001833	....	....	
14,750	59,000	.020500	.001107	....	....	
15,000	60,000	.022367	.001867	.020100	.006767	
15,500	62,000	.024933	.002566	....	....	
16,000	64,000	.028433	.003500	....	....	
16,500	66,000	.032400	.003967	....	....	
17,000	68,000	.036667	.004267	....	....	
17,500	70,000	.041667	.005000	....	....	
18,000	72,000	.047333	.005666	....	....	
18,500	74,000	.055667	.008334	....	....	
19,000	76,000	.064167	.008500	....	....	
19,500	78,000	.078333	.014166	....	....	
20,000	80,000	.1100	.031667	....	....	Tensile strength.
18,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,000
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.70 from neck
Character of broken surface		granular, with a dull spot at circumference, cracks opened in cylindrical surface in vicinity of fracture.
Elongation of inch sections		″.24*, ″.11, ″.07

No. 694.

Marks, $\overset{8\ T_3}{B\ T_2\ O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000733	.000100	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	.000033	.000033	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000033	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001367	.000100	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.002167	.000767	....	....	
11,250	45,000	.009333	.007166	.007533	.007500	
11,500	46,000	.010000	.000667	....	....	
11,750	47,000	.010267	.000267	....	....	
12,000	48,000	.011567	.001300	....	....	
12,250	49,000	.012667	.001100	....	....	
12,500	50,000	.014167	.001500	.012200	.004667	
12,750	51,000	.015033	.000866	....	....	
13,000	52,000	.016267	.001234	....	....	
13,250	53,000	.017167	.000900	....	....	
13,500	54,000	.018833	.001666	....	....	
13,750	55,000	.020100	.001267	.017933	.005733	
14,000	56,000	.021400	.001300	....	....	
14,250	57,000	.022600	.001200	....	....	
14,500	58,000	.024333	.001733	....	....	
14,750	59,000	.026000	.001667	....	....	
15,000	60,000	.028567	.002567	.026000	.008067	
15,500	62,000	.031667	.003100	....	....	
16,000	64,000	.035500	.003833	....	....	
16,500	66,000	.040500	.005000	....	....	
17,000	68,000	.045667	.005167	....	....	
17,500	70,000	.052833	.007166	....	....	
18,000	72,000	.060900	.008067	....	....	
18,500	74,000	.071000	.010100	....	....	
19,000	76,000	.0833	.0123	....	....	
19,500	78,000	.1100	.0267	....	....	
19,790	79,160	.1667	.0567	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8563
Hardness		12.78
Tensile strength per square inch of original section	pounds..	79,160
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	.2467
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.1 from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ″.22, ″.13

No. 695.

Marks, $\mathrm{B}\,\overset{8\;\mathrm{T}_6}{\mathrm{T}_3}\,\mathrm{M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	.000033	.000033	
3, 750	15, 000	.000467	.000134	.000033	0.	
5, 000	20, 000	.000633	.000166	.000033	0.	
6, 250	25, 000	.000800	.000167	.000033	0.	
7, 500	30, 000	.001000	.000200	.000067	.000034	
8, 750	35, 000	.001133	.000133	.000067	0.	
9, 000	36, 000	.001200	.000067	....	....	
9, 250	37, 000	.001233	.000033	....	....	
9, 500	38, 000	.001267	.000034	....	....	Elastic limit.
9, 750	39, 000	.001367	.000100	....	....	
10, 000	40, 000	.001467	.000100	.000267	.000200	
10, 250	41, 000	.003933	.002466	....	....	
10, 500	42, 000	.005000	.001067	....	....	
10, 750	43, 000	.006000	.001000	....	....	
11, 000	44, 000	.006833	.000833	....	....	
11, 250	45, 000	.007800	.000967	.006233	.005966	
11, 500	46, 000	.008700	.000900	....	....	
11, 750	47, 000	.009567	.000867	....	....	
12, 000	48, 000	.011067	.001500	....	....	
12, 250	49, 000	.012100	.001033	....	....	
12, 500	50, 000	.013233	.001133	.011400	.005167	
12, 750	51, 000	.013934	.000700	....	....	
13, 000	52, 000	.015333	.001400	....	....	
13, 250	53, 000	.016400	.001067	....	....	
13, 500	54, 000	.017767	.001367	....	....	
13, 750	55, 000	.019000	.001233	.016800	.005400	
14, 000	56, 000	.020333	.001333	....	....	
14, 250	57, 000	.021667	.001334	....	....	
14, 500	58, 000	.023333	.001666	....	....	
14, 750	59, 000	.025033	.001700	....	....	
15, 000	60, 000	.026667	.001634	.024333	.007533	
15, 500	62, 000	.030167	.003500	....	....	
16, 000	64, 000	.034000	.003833	....	....	
16, 500	66, 000	.038500	.004500	....	....	
17, 000	68, 000	.044000	.005500	....	....	
17, 500	70, 000	.051500	.007500	....	....	
18, 000	72, 000	.057667	.006167	....	....	
18, 500	74, 000	.068333	.010666	....	....	
19, 000	76, 000	.082167	.013834	....	....	
19, 500	78, 000	.1067	.024533	....	....	
19, 840	79, 360	.1667	.0600	....	....	Tensile strength.
16, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	79, 360
Elastic limit per square inch of original section	do	38, 000
Elongation per inch after rupture	inch	0. 2767
Elongation per inch under strain at elastic limit	do	.001267
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		″.17, ″.47*, ″.19

No. 696.

Marks, $\overset{8\ T_5}{M\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000067	. 000067	0.	....	
2, 500	10, 000	. 000167	. 000100	0.	....	
3, 750	15, 000	. 000333	. 000166	0.	....	
5, 000	20, 000	. 000500	. 000167	0.	....	
6, 250	25, 000	. 000667	. 000167	0.	....	
7, 500	30, 000	. 000833	. 000166	0.	....	
8, 750	35, 000	. 001000	. 000167	0.	....	
10, 000	40, 000	. 001167	. 000167	0.	....	
10, 250	41, 000	. 001167	0.	....	....	
10, 500	42, 000	. 001200	. 000033	....	....	
10, 750	43, 000	. 001233	. 000033	....	....	
11, 000	44, 000	. 001267	. 000034	....	....	
11, 250	45, 000	. 001300	. 000033	0.	....	Elastic limit.
11, 500	46, 000	. 009433	. 008133	....	....	
11, 750	47, 000	. 010033	. 000600	....	....	
12, 000	48, 000	. 011267	. 001234	....	....	
12, 250	49, 000	. 012167	. 000900	....	....	
12, 500	50, 000	. 013700	. 001533	. 011800	. 011800	
12, 750	51, 000	. 014333	. 000633	....	....	
13, 000	52, 000	. 015667	. 001334	....	....	
13, 250	53, 000	. 016933	. 001266	....	....	
13, 500	54, 000	. 018667	. 001734	....	....	
13, 750	55, 000	. 019800	. 001133	. 017667	. 005867	
14, 000	56, 000	. 021333	. 001533	....	....	
14, 250	57, 000	. 022700	. 001367	....	....	
14, 500	58, 000	. 024167	. 001467	....	....	
14, 750	59, 000	. 026000	. 001833	....	....	
15, 000	60, 000	. 027667	. 001667	. 025267	. 007600	
15, 500	62, 000	. 031367	. 003700	....	....	
16, 000	64, 000	. 036000	. 004633	....	....	
16, 500	66, 000	. 040500	. 004500	....	....	
17, 000	68, 000	. 045833	. 005333	....	....	
17, 500	70, 000	. 053500	. 007667	....	....	
18, 000	72, 000	. 061367	. 007867	....	....	
18, 500	74, 000	. 072667	. 011300	....	....	
19, 000	76, 000	. 087667	. 015000	....	....	
19, 500	78, 000	. 1267	. 039033	....	....	
19, 690	78, 760	. 1800	. 0533	....	....	Tensile strength.
16, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78, 760
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2067
Elongation per inch under strain at elastic limit	do....	. 001300
Reduction in diameter at point of rupture	do....	. 164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		″.1 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.22, ″.46*, ″.21

TUBE No. 5.—8″ *Converted Rifle.*

No. 693.

Marks, $\begin{smallmatrix}8\ \mathrm{T5}\\ \mathrm{B\ T5\ 1}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001233	.000200	.000033	.000033	
10,250	41,000	.001367 .001767	.000134 .000400	....	....	Elastic limit.
10,500	42,000	.002167	.000400	....	....	
10,750	43,000	.002500	.000333	....	....	
11,000	44,000	.003467	.000967	....	....	
11,250	45,000	.004533	.001066	.003133	.003100	
11,500	46,000	.006233	.001700	....	....	
11,750	47,000	.006633	.000400	....	....	
12,000	48,000	.007933	.001300	....	....	
12,250	49,000	.008833	.000900	....	....	
12,500	50,000	.010000	.001167	.008267	.005134	
12,750	51,000	.010733	.000733	....	....	
13,000	52,000	.012000	.001267	....	....	
13,250	53,000	.013033	.001033	....	....	
13,500	54,000	.014067	.001034	.013333	.005066	
13,750	55,000	.015400	.001333	....	....	
14,000	56,000	.016600	.001200	....	....	
14,250	57,000	.017500	.000900	....	....	
14,500	58,000	.019333	.001833	....	....	
14,750	59,000	.020500	.001167	....	....	
15,000	60,000	.022367	.001867	.020100	.006767	
15,500	62,000	.024933	.002566	....	....	
16,000	64,000	.028433	.003500	....	....	
16,500	66,000	.032400	.003967	....	....	
17,000	68,000	.036667	.004267	....	....	
17,500	70,000	.041667	.005000	....	....	
18,000	72,000	.047333	.005666	....	....	
18,500	74,000	.055667	.008334	....	....	
19,000	76,000	.064167	.008500	....	....	
19,500	78,000	.078333	.014166	....	....	
20,000	80,000	.1100	.031667	....	....	Tensile strength.
18,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds.. 80,000
Elastic limit per square inch of original section....................do.... 40,000
Elongation per inch after rupture....................inch.. 0.1400
Elongation per inch under strain at elastic limit....................do.... .001233
Reduction in diameter at point of rupture....................do.... .074
Reduction in area after rupture, per centum of original section.................... 24.6
Position of rupture.................... ″.70 from neck
Character of broken surface......granular, with a dull spot at circumference, cracks opened in cylindrical surface in vicinity of fracture.
Elongation of inch sections.................... ″.24*, ″.11, ″.07

No. 698.

Marks, $\overset{8\ T_{5}}{M\ T_{3}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.		
2,500	10,000	.000233	.000166	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000733	.000166	0.		
7,500	30,000	.000900	.000167	0.		
8,750	35,000	.001067	.000167	0.		
10,000	40,000	.001233	.000166	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001400	.000067			
11,250	45,000	.001433	.000033	.000033	.000033	Elastic limit.
11,500	46,000	.009200	.007767			
11,750	47,000	.010500	.001300			
12,000	48,000	.011000	.000500			
12,250	49,000	.011633	.000633			
12,500	50,000	.013000	.001367	.011067	.011034	
12,750	51,000	.014067	.001067			
13,000	52,000	.015233	.001166			
13,250	53,000	.016333	.001100			
13,500	54,000	.017500	.001167			
13,750	55,000	.018833	.001333	.016667	.005000	
14,000	56,000	.020333	.001500			
14,250	57,000	.021367	.001034			
14,500	58,000	.023333	.001966			
14,750	59,000	.024667	.001334			
15,000	60,000	.026667	.002000	.024167	.007500	
15,500	62,000	.030167	.003500			
16,000	64,000	.034000	.003833			
16,500	66,000	.038733	.004733			
17,000	68,000	.044667	.005934			
17,500	70,000	.050333	.005666			
18,000	72,000	.057167	.006834			
18,500	74,000	.067833	.010666			
19,000	76,000	.081667	.013834			
19,500	78,000	.1067	.025033			
19,660	78,640	.1300 .1533	.0233 .0233			Tensile strength.
17,200						Load at time of rupture.

General summary.

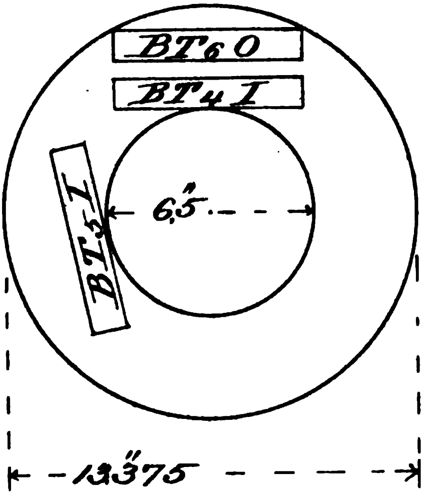
Tensile strength per square inch of original section	pounds..	78,640
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2458
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do...	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		″.85 from neck
Character of broken surface		silky, cup-shaped end
Elongation of inch sections		″.42*, ″.18, ″18

8" Converted Rifle

Tube No. 5

Additional Specimens

Breech



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No. 787.

Marks, $\overset{8\,T_5}{B\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000767	.000134	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001067	.000134	0.		
9,000	36,000	.001100	.000033			
9,250	37,000	.001133	.000033			
9,500	38,000	.001200	.000067			
9,750	39,000	.001233	.000033			
10,000	40,000	.001267	.000034	0.		
10,250	41,000	.001300	.000033			
10,500	42,000	.001333	.000033			
10,750	43,000	.001367	.000034			
11,000	44,000	.001400	.000033			Elastic limit.
11,250	45,000	.002367	.000967	.000933	.000933	
11,500	46,000	.003567	.001200			
11,750	47,000	.004300	.000733			
12,000	48,000	.005300	.001000			
12,250	49,000	.006233	.000933			
12,500	50,000	.007167	.000934	.005367	.004434	
12,750	51,000	.008000	.000833			
13,000	52,000	.009000	.001000			
13,250	53,000	.009933	.000933			
13,500	54,000	.011267	.001334			
13,750	55,000	.012333	.001066			
14,000	56,000	.013367	.001034			
14,250	57,000	.014300	.000933			
14,500	58,000	.015633	.001333			
14,750	59,000	.016700	.001067			
15,000	60,000	.018267	.001567			
15,500	62,000	.020967	.002700			
16,000	64,000	.024000	.003033			
16,500	66,000	.027200	.003200			
17,000	68,000	.030667	.003467			
17,500	70,000	.034267	.003600			
18,000	72,000	.038967	.004700			
18,500	74,000	.044667	.005700			
19,000	76,000	.050933	.006266			
19,500	78,000	.060000	.009067			
20,000	80,000	.069667	.009667			
20,500	82,000	.0933	.023633			
20,740	82,960	.1600	.0667			Tensile strength.
18,500						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	82,960
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		30.4
Position of rupture		″.4 from neck
Character of broken surface		granular; dull spot at circumference
Elongation of inch sections		″.31*, ″.10, ″.09

No. 788.

Marks, $^{8\,T_5}_{B\,T_5\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001100	0.	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001233	.000066	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001383	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	Elastic limit.
11,250	45,000	.003500	.002100	.002033	.002033	
11,500	46,000	.005367	.001867	....	....	
11,750	47,000	.006933	.001566	....	....	
12,000	48,000	.007733	.000800	....	....	
12,250	49,000	.008667	.000934	....	....	
12,500	50,000	.010000	.001333	.007967	.005934	
12,750	51,000	.010433	.000433	....	....	
13,000	52,000	.011633	.001200	....	....	
13,250	53,000	.012600	.000967	....	....	
13,500	54,000	.013967	.001367	....	....	
13,750	55,000	.015067	.001100	....	....	
14,000	56,000	.016500	.001433	....	....	
14,250	57,000	.017667	.001167	....	....	
14,500	58,000	.019333	.001666	....	....	
14,750	59,000	.020433	.001100	....	....	
15,000	60,000	.022000	.001567	....	....	
15,500	62,000	.025267	.003267	....	....	
16,000	64,000	.028667	.003400	....	....	
16,500	66,000	.032833	.004166	....	....	
17,000	68,000	.037200	.004367	....	....	
17,500	70,000	.042167	.004967	....	....	
18,000	72,000	.048400	.006233	....	....	
18,500	74,000	.056000	.007600	....	....	
19,000	76,000	.065333	.009333	....	....	
19,500	78,000	.0767	.011367	....	....	
20,000	80,000	.1033	.0266	....	....	
20,310	81,240	.1567	.0534	....	....	Tensile strength.
17,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81,240
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.55 from neck
Character of broken surface		silky
Elongation of inch sections		″.38*, ″.15, ″.16

No. 789.

Marks, $^{8\,T_5}_{B\,T_6\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	—.000023	—.000033	
3,750	15,000	.000400	.000133	—.000033	0.	
5,000	20,000	.000567	.000167	—.000033	0.	
6,250	25,000	.000733	.000166	—.000033	0.	
7,500	30,000	.000900	.000167	—.000033	0.	
8,750	35,000	.001067	.000167	—.000033	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	—.000033	0.	Elastic limit.
10,250	41,000	.002700	.000467	....	....	
10,500	42,000	.004233	.001533	....	....	
10,750	43,000	.005267	.001034	....	....	
11,000	44,000	.006267	.001000	....	....	
11,250	45,000	.006900	.000633	.005300	.005333	
11,500	46,000	.007900	.001000	....	....	
11,750	47,000	.008467	.000567	....	....	
12,000	48,000	.009367	.000900	....	....	
12,250	49,000	.010300	.000933	....	....	
12,500	50,000	.011400	.001100	.000700	.004400	
12,750	51,000	.012267	.000867	....	....	
13,000	52,000	.013267	.001000	....	....	
13,250	53,000	.014233	.000966	....	....	
13,500	54,000	.015600	.001367	....	....	
13,750	55,000	.016667	.001067	....	....	
14,000	56,000	.018033	.001366	....	....	
14,250	57,000	.019267	.001234	....	....	
14,500	58,000	.020700	.001433	....	....	
14,750	59,000	.021833	.001133	....	....	
15,000	60,000	.023600	.001767	....	....	
15,500	62,000	.026667	.003067	....	....	
16,000	64,000	.030033	.003366	....	....	
16,500	66,000	.034000	.003967	....	....	
17,000	68,000	.038733	.004733	....	....	
17,500	70,000	.043833	.005100	....	....	
18,000	72,000	.049667	.005834	....	....	
18,500	74,000	.057667	.008000	....	....	
19,000	76,000	.067000	.009333	....	....	
19,500	78,000	.0867	.0197	....	....	
20,000	80,000	.1167	.0300	....	....	
20,070	80,280	.1333	.0166	....	....	
20,140	80,560	.1500	.0167	....	....	Tensile strength.
17,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds..	80,560
Elastic limit per square inch of original section..........do....	40,000
Elongation per inch after rupture..........inch..	0.2367
Elongation per inch under strain at elastic limit..........do....	.001233
Reduction in diameter at point of rupture..........do....	.154
Reduction in area after rupture, per centum of original section..........	47.2
Position of rupture,..........	1″.2 from neck
Character of broken surface..........	silky
Elongation of inch sections..........	″.34*, ″.25, ″.12

TUBE No. 6.—8″ *Converted Rifle.*

No. 652.

Marks, $\overset{8\ T}{E\ T_1\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000267	.000267	.000067	.000067	
2,500	10,000	.000467	.000200	.000067	0.	
3,750	15,000	.000633	.000166	.000067	0.	
5,000	20,000	.000767	.000134	.000067	0.	
6,250	25,000	.000933	.000166	.000100	.000033	
7,500	30,000	.001133	.000200	.000100	0.	
7,750	31,000	.001133	0.	....	....	
8,000	32,000	.001167	.000034	....	....	
8,250	33,000	.001200	.000033	....	....	
8,500	34,000	.001233	.000033	....	....	
8,750	35,000	.001267	.000034	.000100	0.	
9,000	36,000	.001333	.000066	....	....	
9,250	37,000	.001400	.000067	....	....	Elastic limit.
9,500	38,000	.001600	.000200	....	....	
9,750	39,000	.002400	.000800	....	....	
10,000	40,000	.004367	.001967	.002900	.002800	
10,250	41,000	.004833	.000466	....	....	
10,500	42,000	.005767	.000934	....	....	
10,750	43,000	.006400	.000633	....	....	
11,000	44,000	.007600	.001200	....	....	
11,250	45,000	.008367	.000767	.006667	.003767	
11,500	46,000	.010267	.001900	....	....	
11,750	47,000	.010733	.000466	....	....	
12,000	48,000	.011700	.000967	....	....	
12,250	49,000	.012667	.000967	....	....	
12,500	50,000	.014100	.001433	.012300	.005633	
12,750	51,000	.015667	.001567	....	....	
13,000	52,000	.016667	.001000	....	....	
13,250	53,000	.017600	.000933	....	....	
13,500	54,000	.019000	.001400	....	....	
13,750	55,000	.020400	.001400	....	....	
14,000	56,000	.022667	.002267	....	....	
14,250	57,000	.023733	.001066	....	....	
14,500	58,000	.025500	.001767	....	....	
14,750	59,000	.027000	.001500	....	....	
15,000	60,000	.029000	.002000	....	....	
15,500	62,000	.033333	.004333	....	....	
16,000	64,000	.037667	.004334	....	....	
16,500	66,000	.042733	.005066	....	....	
17,000	68,000	.048833	.006100	....	....	
17,500	70,000	.056667	.007834	....	....	
18,000	72,000	.067000	.010333	....	....	
18,500	74,000	.082100	.015100	....	....	
18,600	74,400	.1000	.0179	....	....	Tensile strength.
17,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8571
Hardness		13.40
Tensile strength per square inch of original section	pounds.	74,400
Elastic limit per square inch of original section	do	37,000
Elongation per inch after rupture	inch	0.1100
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		″.35 from middle of stem
Character of broken surface		granular; radiating from a defective spot in the metal at the circumference
Elongation of inch sections		″.10, ″.13*, .10

No. 653.

Marks, $^{8\,T_6}_{B\,T_2O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000800	.000133	0.	....	
7,500	30,000	.001000	.000200	0.	....	
7,750	31,000	.001000	0.	....	....	
8,000	32,000	.001033	.000033	....	....	
8,250	33,000	.001067	.000034	....	....	
8,500	34,000	.001133	.000066	....	....	
8,750	35,000	.001167	.000034	0.	....	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001267	.000067	....	....	Elastic limit.
9,500	38,000	.001400	.000133	....	....	
9,750	39,000	.001800	.000400	....	....	
10,000	40,000	.002600	.000800	.001300	.001300	
10,250	41,000	.003300	.000700	....	....	
10,500	42,000	.004267	.000967	....	....	
10,750	43,000	.004900	.000633	....	....	
11,000	44,000	.005667	.000767	....	....	
11,250	45,000	.006667	.001000	.005100	.003800	
11,500	46,000	.007833	.001166	....	....	
11,750	47,000	.008667	.000834	....	....	
12,000	48,000	.009833	.001166	....	....	
12,250	49,000	.010667	.000834	....	....	
12,500	50,000	.012333	.001666	.010467	.005367	
12,750	51,000	.013333	.001000	....	....	
13,000	52,000	.014333	.001000	....	....	
13,250	53,000	.015333	.001000	....	....	
13,500	54,000	.016900	.001567	....	....	
13,750	55,000	.018167	.001267	....	....	
14,000	56,000	.019567	.001400	....	....	
14,250	57,000	.020733	.001166	....	....	
14,500	58,000	.022600	.001867	....	....	
14,750	59,000	.024067	.001467	....	....	
15,000	60,000	.026033	.001966	....	....	
15,500	62,000	.030600	.004567	....	....	
16,000	64,000	.033167	.002567	....	....	
16,500	66,000	.038233	.005066	....	....	
17,000	68,000	.044000	.005767	....	....	
17,500	70,000	.051167	.007167	....	....	
18,000	72,000	.058933	.007766	....	....	
18,500	74,000	.069167	.010234	....	....	
19,000	76,000	.0867	.017533	....	....	
19,500	78,000	.1200	.0333	....	....	
19,560	78,240	.1467	.0267	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,240
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do ...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.20 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.10, ″.39*, ″.14

No. 654.

Marks, $\text{B}\overset{8\,\text{T}_8}{\text{T}_3}\text{M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000267	.000267	.000033	.000033	
2,500	10,000	.000433	.000166	.000033	0.	
3,750	15,000	.000600	.000167	.000033	0.	
5,000	20,000	.000767	.000167	.000033	0.	
6,250	25,000	.000933	.000166	.000067	.000034	
7,500	30,000	.001100	.000167	.000100	.000033	
7,750	31,000	.001133	.000033	....	....	
8,000	32,000	.001167	.000034	....	....	
8,250	33,000	.001200	.000033	....	....	
8,500	34,000	.001233	.000033	....	....	
8,750	35,000	.001300	.000067	.000133	.000033	
9,000	36,000	.001367	.000067	....	....	
9,250	37,000	.001433	.000066	....	....	Elastic limit.
9,500	38,000	.001733	.000300	....	....	
9,750	39,000	.002100	.000367	....	....	
10,000	40,000	.003267	.001167	.002067	.001934	
10,250	41,000	.006133	.002866	....	....	
10,500	42,000	.007100	.000967	....	....	
10,750	43,000	.008067	.000967	....	....	
11,000	44,000	.009267	.001200	....	....	
11,250	45,000	.010367	.001100	.008600	.006533	
11,500	46,000	.011033	.000666	....	....	
11,750	47,000	.011733	.000700	....	....	
12,000	48,000	.013833	.002100	....	....	
12,250	49,000	.014700	.000867	....	....	
12,500	50,000	.016067	.001367	.013767	.005167	
12,750	51,000	.017000	.000933	....	....	
13,000	52,000	.018333	.001333	....	....	
13,250	53,000	020000	.001667	....	....	
13,500	54,000	.021567	.001567	....	....	
13,750	55,000	.022900	.001333	....	....	
14,000	56,000	.024700	.001800	....	....	
14,250	57,000	.026333	.001633	....	....	
14,500	58,000	.028567	.002234	....	....	
14,750	59,000	.029833	.001266	....	....	
15,000	60,000	.032067	.002234	....	....	
15,500	62,000	.036933	.004866	....	....	
16,000	64,000	.041333	.004400	....	....	
16,500	66,000	.047500	.006167	....	....	
17,000	68,000	.056333	.008833	....	....	
17,500	70,000	.066167	.009834	....	....	
18,000	72,000	.078467	.012300	....	....	
18,500	74,000	.1067	.028233	....	....	
18,520	74,080	.1267	.0200	....	....	Tensile strength.
13,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	74,080
Elastic limit per square inch of original section	do ...	37,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		30.4
Position of rupture		″.60 from neck
Character of broken surface		silky, spot of light colored metal at the center
Elongation of inch sections		″.23*, ″.10, ″.10

No. 655.

Marks, $\overset{8\,T_6}{M\,T_1\,I}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000333	.000333	0.	....	
2,500	10,000	.000467	.000134	0.	....	
3,750	15,000	.000633	.000166	0.	....	
5,000	20,000	.000767	.000134	0.	....	
6,250	25,000	.000933	.000166	.000033	.000033	
7,500	30,000	.001100	.000167	.000033	0.	
7,750	31,000	.001133	.000033	....	....	
8,000	32,000	.001167	.000034	....	....	
8,250	33,000	.001200	.000033	....	....	
8,500	34,000	.001233	.000034	....	....	
8,750	35,000	.001267	.000034	.000067	.000034	
9,000	36,000	.001300	.000033	....	....	
9,250	37,000	.001333	.000033	....	....	
9,500	38,000	.001367	.000034	....	....	
9,750	39,000	.001400	.000033	....	....	
10,000	40,000	.001433	.000033	.000067	0.	Elastic limit.
10,250	41,000	.001600	.000167	....	....	
10,500	42,000	.001933	.000333	....	....	
10,750	43,000	.002167	.000234	....	....	
11,000	44,000	.003500	.001333	....	....	
11,250	45,000	.005267	.001767	.003600	.003533	
11,500	46,000	.006667	.001400	....	....	
11,750	47,000	.007067	.000400	....	....	
12,000	48,000	.007533	.000466	....	....	
12,250	49,000	.008667	.001134	....	....	
12,500	50,000	.010700	.002033	.008767	.005167	
12,750	51,000	.011367	.000667	....	....	
13,000	52,000	.012267	.000900	....	....	
13,250	53,000	.013167	.000900	....	....	
13,500	54,000	.014700	.001533	....	....	
13,750	55,000	.015667	.000967	....	....	
14,000	56,000	.017067	.001400	....	....	
14,250	57,000	.018033	.000966	....	....	
14,500	58,000	.019733	.001700	....	....	
14,750	59,000	.020700	.000967	....	....	
15,000	60,000	.022267	.001567	....	....	
15,500	62,000	.025500	.003233	....	....	
16,000	64,000	.028667	.003167	....	....	
16,500	66,000	.032700	.004033	....	....	
17,000	68,000	.036833	.004133	....	....	
17,500	70,000	.042733	.005900	....	....	
18,000	72,000	.048167	.005434	....	....	
18,500	74,000	.055100	.006933	....	....	
19,000	76,000	.064400	.009300	....	....	
19,500	78,000	.078667	.014267	....	....	
20,000	80,000	.0867	.008033	....	....	
20,400	81,600	.1633	.0766	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8571
Hardness	14.12
Tensile strength per square inch of original section ....pounds..	81,600
Elastic limit per square inch of original section ....do....	40,000
Elongation per inch after rupture ....inch..	0.2783
Elongation per inch under strain at elastic limit ....do....	.001433
Reduction in diameter at point of rupture ....do....	.174
Reduction in area after rupture, per centum of original section	52.2
Position of rupture	".9 from neck
Character of broken surface	silky
Elongation of inch sections	".41*, ".21, ".20

No. 656.

Marks, $\frac{8\ T_6}{M\ T_2\ O}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000333	.000333	0.		
2,500	10,000	.000467	.000134	0.		
3,750	15,000	.000633	.000166	0.		
5,000	20,000	.000800	.000167	0.		
6,250	25,000	.001000	.000200	0.		
7,500	30,000	.001133	.000133	0.		
7,750	31,000	.001167	.000034			
8,000	32,000	.001200	.000033			
8,250	33,000	.001200	0.			
8,500	34,000	.001233	.000033			
8,750	35,000	.001267	.000034	0.		
9,000	36,000	.001300	.000033			
9,250	37,000	.001333	.000033			
9,500	38,000	.001367	.000034			
9,750	39,000	.001400	.000033			Elastic limit.
10,000	40,000	.001533	.000133	.000167	.000167	
10,250	41,000	.001700	.000167			
10,500	42,000	.002533	.000833			
10,750	43,000	.004667	.002134			
11,000	44,000	.006333	.001666			
11,250	45,000	.008467	.002134	.006667	.006500	
11,500	46,000	.009000	.000533			
11,750	47,000	.009567	.000567			
12,000	48,000	.010233	.000666			
12,250	49,000	.011067	.000834			
12,500	50,000	.013333	.002266	.011400	.004733	
12,750	51,000	.013833	.000500			
13,000	52,000	.014700	.000867			
13,250	53,000	.015933	.001233			
13,500	54,000	.017433	.001500			
13,750	55,000	.019000	.001567			
14,000	56,000	.020100	.001100			
14,250	57,000	.022767	.002667			
14,500	58,000	.023733	.000966			
14,750	59,000	.024400	.000667			
15,000	60,000	.025933	.001533			
15,500	62,000	.031100	.005167			
16,000	64,000	.034500	.003400			
16,500	66,000	.038500	.004000			
17,000	68,000	.043500	.005000			
17,500	70,000	.050933	.007433			
18,000	72,000	.059000	.008067			
18,500	74,000	.068667	.009667			
19,000	76,000	.083100	.014433			
19,500	78,000	.1167	.0336			
19,700	78,800	.1633	.0466			Tensile strength.
17,200						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,800
Elastic limit per square inch of original section	do ..	39,000
Elongation per inch after rupture	inch..	0.2667
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		".16, ".44, ".20

No. 657.

Marks, $\overset{{}^{5}T_{6}}{MT_{3}M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000367	.000367	0.	....	
2,500	10,000	.000567	.000200	0.	....	
3,750	15,000	.000667	.000100	0.	....	
5,000	20,000	.000867	.000200	0.	....	
6,250	25,000	.001000	.000133	0.	....	
7,500	30,000	.001167	.000167	.000033	.000033	
7,750	31,000	.001200	.000033	....	....	
8,000	32,000	.001233	.000033	....	....	
8,250	33,000	.001267	.000034	....	....	
8,500	34,000	.001300	.000033	....	....	
8,750	35,000	.001333	.000033	.000033	.000033	
9,000	36,000	.001367	.000034	....	....	
9,250	37,000	.001400	.000033	....	....	
9,500	38,000	.001467	.000067	....	....	
9,750	39,000	.001533	.000066	....	....	
10,000	40,000	.001633	.000100	.000133	.000100	
10,250	41,000	.001700	.000067	....	....	Elastic limit.
10,500	42,000	.001867	.000167	....	....	
10,750	43,000	.002167	.000300	....	....	
11,000	44,000	.003733	.001566	....	....	
11,250	45,000	.005967	.002234	.004267	.004134	
11,500	46,000	.007033	.001066	....	....	
11,750	47,000	.007567	.000534	....	....	
12,000	48,000	.008833	.001266	....	....	
12,250	49,000	.009867	.001034	....	....	
12,500	50,000	.010867	.001000	.008900	.004633	
12,750	51,000	.011600	.000733	....	....	
13,000	52,000	.012400	.000800	....	....	
13,250	53,000	.013167	.000767	....	....	
13,500	54,000	.015233	.002066	....	....	
13,750	55,000	.016200	.000967	....	....	
14,000	56,000	.017333	.001133	....	....	
14,250	57,000	.018400	.001067	....	....	
14,500	58,000	.019833	.001433	....	....	
14,750	59,000	.021000	.001167	....	....	
15,000	60,000	.022833	.001833	....	....	
15,500	62,000	.025333	.002500	....	....	
16,000	64,000	.029000	.003667	....	....	
16,500	66,000	.033033	.004033	....	....	
17,000	68,000	.033733	.000700	....	....	
17,500	70,000	.041700	.007967	....	....	
18,000	72,000	.047600	.005900	....	....	
18,500	74,000	.055500	.007900	....	....	
19,000	76,000	.064067	.008567	....	....	
19,500	78,000	.076067	.012600	....	....	
20,000	80,000	.1033	.026633	....	....	
20,310	81,240	.1467	.0434	....	....	Tensile strength.
17,500	....	....	....	....	....	Load at time of rupture.

General summary.

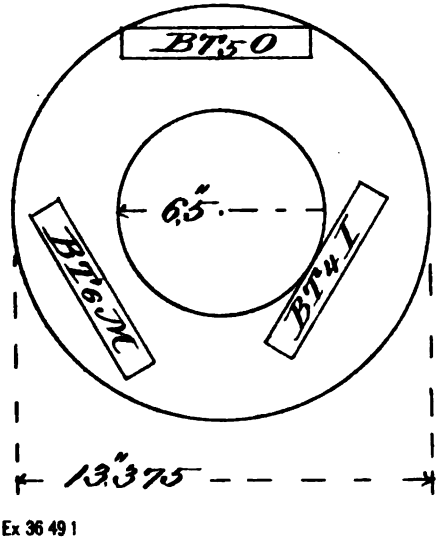
Tensile strength per square inch of original section	pounds..	81,240
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2333
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.41*, ″.18, ″.11

8" Converted Rifle

Tube No. 6

Additional Specimens

Breech



S Ex 36 49 1

No. 750.

Marks, $\overset{8\,T_4}{B\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001100	.000200	.000033	.000033	Elastic limit.
9,000	36,000	.001267	.000167	....	....	
9,250	37,000	.002233	.000966	....	....	
9,500	38,000	.003500	.001267	....	....	
9,750	39,000	.004400	.000900	....	....	
10,000	40,000	.005600	.001200	.004133	.004100	
10,250	41,000	.006667	.001067	....	....	
10,500	42,000	.007833	.001166	....	....	
10,750	43,000	.008533	.000700	....	....	
11,000	44,000	.009633	.001100	....	....	
11,250	45,000	.010400	.000767	.008767	.004634	
11,500	46,000	.012067	.001667	....	....	
11,750	47,000	.012833	.000766	....	....	
12,000	48,000	.014367	.001534	....	....	
12,250	49,000	.015367	.001000	....	....	
12,500	50,000	.017267	.001900	.015133	.006366	
12,750	51,000	.018400	.001133	....	....	
13,000	52,000	.019867	.001467	....	....	
13,250	53,000	.021033	.001166	....	....	
13,500	54,000	.023000	.001967	....	....	
13,750	55,000	.024667	.001667	....	....	
14,000	56,000	.026533	.001866	....	....	
14,250	57,000	.028167	.001634	....	....	
14,500	58,000	.030400	.002233	....	....	
14,750	59,000	.032167	.001767	....	....	
15,000	60,000	.035133	.002966	....	....	
15,500	62,000	.040500	.005367	....	....	
16,000	64,000	.047333	.006833	....	....	
16,500	66,000	.053733	.006400	....	....	
17,000	68,000	.063000	.009267	....	....	
17,500	70,000	.076333	.013333	....	....	
18,000	72,000	.0967	.020367	....	....	
18,500	74,000	.1400	.0433	....	....	
18,520	74,080	.1733	.0333	....	....	Tensile strength.
15,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	74,080
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.2767
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.174
Reduction of area after rupture, per centum of original section		52.2
Position of rupture		1″.3 from neck
Character of broken surface		silky
Elongation of inch sections		″.36*, ″.31, ″.16

No. 751.

Marks, $\frac{8\ \text{T}_6}{\text{B T}_5\ \text{O}}$.
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	000033	....	....	
9,500	38,000	.001233	000033	....	....	
9,750	39,000	.001300	.000067	....	....	
10,000	40,000	.001333	.000033	.000033	.000033	Elastic limit.
10,250	41,000	.002600	.001267	....	....	
10,500	42,000	.004133	.001533	....	....	
10,750	43,000	.005167	.001034	....	....	
11,000	44,000	.006667	.001500	....	....	
11,250	45,000	.007700	.001033	.005933	.005900	
11,500	46,000	.009000	.001300	....	....	
11,750	47,000	.010333	.001333	....	....	
12,000	48,000	.011133	.000800	....	....	
12,250	49,000	.011933	.000800	....	....	
12,500	50,000	.013400	.001467	.011267	.005334	
12,750	51,000	.014133	.000733	....	....	
13,000	52,000	.015400	.001267	....	....	
13,250	53,000	.016000	.000600	....	....	
13,500	54,000	.017667	.001667	....	....	
13,750	55,000	.019000	.001333	....	....	
14,000	56,000	.020333	.001333	....	....	
14,250	57,000	.021600	.001267	....	....	
14,500	58,000	.023733	.002133	....	....	
14,750	59,000	025000	.001267	....	....	
15,000	60,000	.026667	.001667	....	....	
15,500	62,000	.030933	.004266	....	....	
16,000	64,000	.034500	.003567	....	....	
16,500	66,000	.039667	.005167	....	....	
17,000	68,000	.045000	.005333	....	....	
17,500	70,000	.051667	006667	....	....	
18,000	72,000	.061333	.009666	....	....	
18,500	74,000	.072333	.011000	....	....	
19,000	76,000	.0967	.024367	....	....	
19,480	77,920	.1733	.0766	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 77,920
Elastic limit per square inch of original section..do.... 40,000
Elongation per inch after rupture...inch.. 0.2100
Elongation per inch under strain at elastic limit..do.... .001833
Reduction in diameter at point of rupture..do.... .114
Reduction in area after rupture, per centum of original section........................... 36.4
Position of rupture...". 50 from middle of stem
Character of broken surface... silky
Elongation of inch sections ....".22, ".27*, ".13

No. 752.

Marks, $\overset{8\ T_4}{B\ T_4\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000667	.000231	.000033	.000033	
6,250	25,000	.000707	.000100	.000033	0.	
7,500	30,000	.000967	.000200	.000067	.000034	
8,750	35,000	.001167	.000200	.000133	.000066	
9,000	36,000	.001233	.000066	....	....	Elastic limit.
9,250	37,000	.001633	.000400	....	....	
9,500	38,000	.002733	.001100	....	....	
9,750	39,000	.003967	.001234	....	....	
10,000	40,000	.005033	.001066	.003567	.003434	
10,250	41,000	.005633	.000600	....	....	
10,500	42,000	.006400	.000767	....	....	
10,750	43,000	.007233	.000833	....	....	
11,000	44,000	.008533	.001300	....	....	
11,250	45,000	.009367	.000834	.007733	.004166	
11,500	46,000	.011067	.001700	....	....	
11,750	47,000	.011733	.000666	....	....	
12,000	48,000	.012733	.001000	....	....	
12,250	49,000	.013600	.000867	....	....	
12,500	50,000	.015433	.001833	.013400	.005667	
12,750	51,000	.016367	.000934	....	....	
13,000	52,000	.017467	.001100	....	....	
13,250	53,000	.018433	.000966	....	....	
13,500	54,000	.019933	.001500	....	....	
13,750	55,000	.021533	.001600	....	....	
14,000	56,000	.023333	.001800	....	....	
14,250	57,000	.024700	.001367	....	....	
14,500	58,000	.026600	.001900	....	....	
14,750	59,000	.028067	.001467	....	....	
15,000	60,000	.030167	.002100	....	....	
15,500	62,000	.034467	.004300	....	....	
16,000	64,000	.039167	.004700	....	....	
16,500	66,000	.045867	.006700	....	....	
17,000	68,000	.051600	.005733	....	....	
17,500	70,000	.058833	.007233	....	....	
18,000	72,000	.068433	.009600	....	....	
18,500	74,000	.0933	.024867	....	....	
19,000	76,000	.1267	.0334	....	....	
19,250	77,000	.1667	.0400	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77,000
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.2433
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		1″.3 from neck
Character of broken surface		silky
Elongation of inch sections		″.32, ″.29, ″.12

TUBE No. 7.—8″ *Converted Rifle.*

No. 841.

Marks, $^{8}\,{}^{T_7}_{B\,T_1\,I}$
Diameter, ″.562.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001033	.000133	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001133	.000066	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001200	.000033	....	....	
10, 000	40, 000	.001267	.000067	.000033	.000033	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	Elastic limit.
11, 250	45, 000	.001667	.000267	.000267	.000234	
11, 500	46, 000	.002967	.001300	....	....	
11, 750	47, 000	.003367	.000400	....	....	
12, 000	48, 000	.004933	.001566	....	....	
12, 250	49, 000	.006367	.001434	....	....	
12, 500	50, 000	.007267	.000900	.005433	.005166	
12, 750	51, 000	.007667	.000400	....	....	
13, 000	52, 000	.008367	.000700	....	....	
13, 250	53, 000	.009667	.001300	....	....	
13, 500	54, 000	.010733	.001066	....	....	
13, 750	55, 000	.011833	.001100	....	....	
14, 000	56, 000	.012967	.001134	....	....	
14, 250	57, 000	.013967	.001000	....	....	
14, 500	58, 000	.015200	.001233	....	....	
14, 750	59, 000	.016167	.000967	....	....	
15, 000	60, 000	.017700	.001533	....	....	
15, 500	62, 000	.020333	.002633	....	....	
16, 000	64, 000	.023167	.002834	....	....	
16, 500	66, 000	.026333	.003166	....	....	
17, 000	68, 000	.029500	.003167	....	....	
17, 500	70, 000	.033333	.003833	....	....	
18, 000	72, 000	.038400	.005067	....	....	
18, 500	74, 000	.044000	.005600	....	....	
19, 000	76, 000	.049667	.005667	....	....	
19, 500	78, 000	.057733	.008066	....	....	
20, 000	80, 000	.068833	.011100	....	....	
20, 500	82, 000	.0867	.017867	....	....	
20, 950	83, 800	....	....	....	....	Tensile strength.

General summary.

Specific gravity	7.8528
Hardness	13.65
Tensile strength per square inch of original section .... pounds..	83, 800
Elastic limit per square inch of original section .... do....	44, 000
Elongation per inch after rupture .... inch..	0.1300
Elongation per inch under strain at elastic limit .... do....	.001400
Reduction in diameter at point of rupture .... do....	.054
Reduction in area after rupture, per centum of original section	18.3
Position of rupture	″.5 from middle of stem
Character of broken surface	granular, radiating from a small dull spot at the circumference
Elongation of inch sections	″.14, ″.15*, ″.10

No. 842.

Marks, $\mathrm{B}\,\overset{8\,T_7}{T_2}\,\mathrm{O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000333	.000333	.000100	.000100	
2,500	10,000	.000667	.000334	.000233	.000133	
3,750	15,000	.000867	.000200	.000267	.000034	
5,000	20,000	.001033	.000166	.000267	0.	
6,250	25,000	.001200	.000167	.000300	.000033	
7,500	30,000	.001367	.000167	.000300	0.	
8,750	35,000	.001600	.000233	.000400	.000100	
9,000	36,000	.001633	.000033	....	....	
9,250	37,000	.001700	.000067	....	....	
9,500	38,000	.001767	.000067	....	....	
9,750	39,000	.001900	.000133	....	....	
10,000	40,000	.002000	.000100	.000667	.000267	
10,250	41,000	.002100	.000100	....	....	Probable elastic limit.
10,500	42,000	.002300	.000200	....	....	
10,750	43,000	.002567	.000267	....	....	
11,000	44,000	.003467	.000900	....	....	
11,250	45,000	.004100	.000633	.002567	.001900	
11,500	46,000	.005267	.001167	....	....	
11,750	47,000	.005933	.000666	....	....	
12,000	48,000	.006867	.000934	....	....	
12,250	49,000	.007700	.000833	....	....	
12,500	50,000	.009067	.001367	.007233	.004666	
12,750	51,000	.009633	.000566	....	....	
13,000	52,000	.010233	.000600	....	....	
13,250	53,000	.011333	.001100	....	....	
13,500	54,000	.012633	.001300	....	....	
13,750	55,000	.013500	.000867	....	....	
14,000	56,000	.014733	.001233	....	....	
14,250	57,000	.015667	.000934	....	....	
14,500	58,000	.016933	.001266	....	....	
14,750	59,000	.018033	.001100	....	....	
15,000	60,000	.019333	.001300	....	....	
15,500	62,000	.022000	.002667	....	....	
16,000	64,000	.024900	.002900	....	....	
16,500	66,000	.028000	.003100	....	....	
17,000	68,000	.031667	.003667	....	....	
17,500	70,000	.035733	.004066	....	....	
18,000	72,000	.039667	.003934	....	....	
18,500	74,000	.0433	.003633	....	....	
19,000	76,000	.0533	.0100	....	....	
19,500	78,000	.0633	.0100	....	....	
20,000	80,000	.0733	.0100	....	....	
20,500	82,000	.0967	.0234	....	....	
20,650	82,600	.1167	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	82,600
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.1167
Elongation per inch under strain at elastic limit	do	.002100
Reduction in diameter at point of rupture	do	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		″.75 from neck
Character of broken surface		granular, radiating from a dull spot at circumference
Elongation of inch sections		″.15*, ″.11, ″.09

No. 845.

Marks, $\overset{8\ T,}{M\ T,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000167	.000100	—.000033	0.	
3,750	15,000	.000300	.000133	—.000033	0.	
5,000	20,000	.000433	.000133	—.000033	0.	
6,250	25,000	.000600	.000167	—.000033	0.	
7,500	30,000	.000800	.000200	—.000033	0.	
8,750	35,000	.000967	.000167	—.000033	0.	
9,000	36,000	.000967	0.	....	....	
9,250	37,000	.001033	.000066	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001167	.000067	—.000033	0.	
10,250	41,000	.001233	.000066	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001367	.000034	0.	.000033	Elastic limit.
11,500	46,000	.001567	.000200	....	....	
11,750	47,000	.002767	.001200	....	....	
12,000	48,000	.003600	.000833	....	....	
12,250	49,000	.004433	.000833	....	....	
12,500	50,000	.005600	.001167	.003800	.003800	
12,750	51,000	.006333	.000733	....	....	
13,000	52,000	.007000	.000667	....	....	
13,250	53,000	.007767	.000767	....	....	
13,500	54,000	.008933	.001166	....	....	
13,750	55,000	.009833	.000900	....	....	
14,000	56,000	.010633	.000800	....	....	
14,250	57,000	.011500	.000867	....	....	
14,500	58,000	.012433	.000933	....	....	
14,750	59,000	.013333	.000900	....	....	
15,000	60,000	.014500	.001167	....	....	
15,500	62,000	.016667	.002167	....	....	
16,000	64,000	.019000	.002333	....	....	
16,500	66,000	.021433	.002433	....	....	
17,000	68,000	.024333	.002900	....	....	
17,500	70,000	.027000	.002667	....	....	
18,000	72,000	.030500	.003500	....	....	
18,500	74,000	.033500	.003000	....	....	
19,000	76,000	.038000	.004500	....	....	
19,500	78,000	.0433	.0053	....	....	
20,000	80,000	.0467	.0034	....	....	
20,500	82,000	.0567	.0100	....	....	
21,000	84,000	.0667	.0100	....	....	
21,500	86,000	.0900	.0233	....	....	
22,000	88,000	.1833 .1467	.0433 .0134	....	....	Tensile strength.
18,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88,000
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.5 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.24, ″.35*, ″.13

No. 846.

Marks, $\overset{8\,T_7}{M\,T_8\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001100	.000067	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000033	.000033	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001267	0.	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001367	.000067	....	....	
11,250	45,000	.001400	.000033	.000100	.000067	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	Elastic limit.
12,000	48,000	.001767	.000300	....	....	
12,250	49,000	.005067	.003300	....	....	
12,500	50,000	.006067	.001000	.004233	.004133	
12,750	51,000	.006400	.000333	....	....	
13,000	52,000	.007067	.000667	....	....	
13,250	53,000	.008067	.001000	....	....	
13,500	54,000	.009067	.001000	....	....	
13,750	55,000	.010000	.000933	....	....	
14,000	56,000	.011100	.001100	....	....	
14,250	57,000	.012067	.000967	....	....	
14,500	58,000	.013067	.001000	....	....	
14,750	59,000	.013933	.000866	....	....	
15,000	60,000	.014933	.001000	....	....	
15,500	62,000	.017267	.002334	....	....	
16,000	64,000	.019667	.002400	....	....	
16,500	66,000	.022000	.002334	....	....	
16,750	68,000	.024567	.002567	....	....	
17,000	70,000	.028333	.003766	....	....	
17,500	72,000	.031567	.003234	....	....	
18,000	74,000	.034667	.003100	....	....	
19,000	76,000	.0400	.005333	....	....	
19,500	78,000	.0433	.0033	....	....	
20,000	80,000	.0500	.0067	....	....	
20,500	82,000	.0600	.0100	....	....	
21,000	84,000	.0700	.0100	....	....	
21,500	86,000	.0967	.0267	....	....	
21,800	87,200	.1500	.0533	....	....	Tensile strength.
19,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	87,200
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.2107
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".38*, ".15, ".12

TUBE No. 8.—8″ *Converted Rifle.*
No. 753.

Marks, $B\,\overset{8\,T_8}{T_1}\,I$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000367	.000200	0.	....	
3, 750	15, 000	.000467	.000100	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	.000033	.000033	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.000033	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001300	.000067	....	....	
10, 000	40, 000	.001333	.000033	.000067	.000034	Elastic limit.
10, 250	41, 000	.002167	.000834	....	....	
10, 500	42, 000	.004833	.002666	....	....	
10, 750	43, 000	.005667	.000834	....	....	
11, 000	44, 000	.006932	.001266	....	....	
11, 250	45, 000	.007933	.001000	.006233	.006166	
11, 500	46, 000	.009300	.001367	....	....	
11, 750	47, 000	.010367	.001067	....	....	
12, 000	48, 000	.011267	.000900	....	....	
12, 250	49, 000	.012167	.000900	....	....	
12, 500	50, 000	.014000	.001833	.012067	.005834	
12, 750	51, 000	.014633	.000633	....	....	
13, 000	52, 000	.015433	.000800	....	....	
13, 250	53, 000	.010633	.001200	....	....	
13, 500	54, 000	.018167	.001534	....	....	
13, 750	55, 000	.019667	.001500	....	....	
14, 000	56, 000	.021067	.001400	....	....	
14, 250	57, 000	.022333	.001266	....	....	
14, 500	58, 000	.024100	.001767	....	....	
11, 750	59, 000	.025500	.001400	....	....	
15, 000	60, 000	.027267	.001767	....	....	
15, 500	62, 000	.031400	.004133	....	....	
16, 000	64, 000	.035600	.004200	....	....	
16, 500	66, 000	.041167	.005567	....	....	
17, 000	68, 000	.047167	.006000	....	....	
17, 500	70, 000	.054733	.007566	....	....	
18, 000	72, 000	.065600	.010867	....	....	
18, 500	74, 000	.080400	.014800	....	....	
18, 900	75, 600	....	....	....	....	Tensile strength.

General summary.

Specific gravity		7. 8607
Hardness		11. 18
Tensile strength per square inch of original section	pounds..	75, 600
Elastic limit per square inch of original section	do....	40, 000
Elongation per inch after rupture	inch..	0. 1133
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21. 4
Position of rupture		″. 35 from middle of stem

Character of broken surface, fine granular; spot of dull colored metal at circumference. Hole, ″. 04 diameter in the steel at point of fracture. Several small holes in cylindrical surface in vicinity of fracture.

Elongation of inch sections .... ″.09, ″. 16*, ″.09

No. 844.

Marks, $\overset{8\ T_7}{M\ T_1}$ I
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	0.	....	— .000033	— .000033	
2,500	10,000	0.	....	— .000033	0.	
3,750	15,000	.000100	.000100	— .000033	0.	
5,000	20,000	.000267	.000167	— .000067	— .000034	
6,250	25,000	.000433	.000166	— .000067	0.	
7,500	30,000	.000600	.000167	— .000067	0.	
8,750	35,000	.000767	.000167	— .000067	0.	
9,000	36,000	.000800	.000033	....	....	
9,250	37,000	.000833	.000033	....	....	
9,500	38,000	.000867	.000034	....	....	
9,750	39,000	.000900	.000033	....	....	
10,000	40,000	.000933	.000033	— .000067	0.	
10,250	41,000	.001000	.000067	....	....	
10,500	42,000	.001033	.000033	....	....	
10,750	43,000	.001067	.000034	....	....	
11,000	44,000	.001100	.000033	....	....	
11,250	45,000	.001133	.000033	— .000067	0.	Elastic limit.
11,500	46,000	.001233	.000100	....	....	
11,750	47,000	.001367	.000134	....	....	
12,000	48,000	.001557	.000200	....	....	
12,250	49,000	.002000	.000433	....	....	
12,500	50,000	.003600	.001600	.001900	.001967	
12,750	51,000	.004433	.000833	....	....	
13,000	52,000	.005100	.000667	....	....	
13,250	53,000	.006100	.001000	....	....	
13,500	54,000	.007333	.001233	....	....	
13,750	55,000	.008000	.000667	....	....	
14,000	56,000	.009333	.001333	....	....	
14,250	57,000	.010300	.000967	....	....	
14,500	58,000	.011233	.000933	....	....	
14,750	59,000	.012167	.000934	....	....	
15,000	60,000	.013333	.001166	....	....	
15,500	62,000	.015267	.001934	....	....	
16,000	64,000	.017467	.002200	....	....	
16,500	66,000	.019833	.002366	....	....	
17,000	68,000	.022367	.002534	....	....	
17,500	70,000	.025600	.003233	....	....	
18,000	72,000	.028767	.003167	....	....	
18,500	74,000	.032367	.003600	....	....	
19,000	76,000	.036000	.003633	....	....	
19,500	78,000	.040167	.004167	....	....	
20,000	80,000	.0467	.006533	....	....	
20,500	82,000	.0533	.0066	....	....	
21,000	84,000	.0667	.0134	....	....	
21,500	86,000	.0800	.0133	....	....	
22,000	88,000	.1200	.0400	....	....	
22,060	88,240	.1600	.0400	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8542
Hardness		14.98
Tensile strength per square inch of original section	pounds..	88,240
Elastic limit per square inch of original section	do ...	45,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001133
Reduction in diameter at point of rupture	do....	1.44
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.9 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		″.37, ″.19, ″.15

No. 755.

Marks, $_{\text{B}}^{8}\overset{\text{T}_{4}}{\text{T}_{3}}\text{M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000433	.000200	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001200	0.	....	....	
10,000	40,000	.001233	.000033	0.	....	Elastic limit.
10,250	41,000	.001400	.000067	....	....	
10,500	42,000	.002600	.001200	....	....	
10,750	43,000	.004100	.001500	....	....	
11,000	44,000	.005100	.001000	....	....	
11,250	45,000	.005967	.000867	.004233	.004233	
11,500	46,000	.006600	.000633	....	....	
11,750	47,000	.007400	.000800	....	....	
12,000	48,000	.008467	.001067	....	....	
12,250	49,000	.009433	.000966	....	....	
12,500	50,000	.010400	.000967	.008300	.004067	
12,750	51,000	.011667	.001267	....	....	
13,000	52,000	.012400	.000733	....	....	
13,250	53,000	.013167	.000767	....	....	
13,500	54,006	.014667	.001500	....	....	
13,750	55,000	.015867	.001200	....	....	
14,000	56,000	.016900	.001033	....	....	
14,250	57,000	.018000	.001100	....	....	
14,500	58,000	.019433	.001433	....	....	
14,750	59,000	.020700	.001267	....	....	
15,000	60,000	.021733	.001033	....	....	
15,500	62,000	.025033	.003300	....	....	
16,000	64,000	.028000	.002967	....	....	
16,500	66,000	.031667	.003667	....	....	
17,000	68,000	.035833	.004166	....	....	
17,500	70,000	.040333	.004500	....	....	
18,000	72,000	.046500	.006167	....	....	
18,500	74,000	.051500	.005000	....	....	
19,000	76,000	.059933	.008433	....	....	
19,500	78,000	.070333	.010400	....	....	
20,000	80,000	.0967	.026367	....	....	
20,500	82,000	.1567	.0600	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82,000
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1" from neck
Character of broken surface		fine granular; dull spot at the circumference
Elongation of inch sections		".24*, ".23, ".15

No. 756.

Marks, $\overset{S\,T_s}{M\,T_1\,I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	.000033	.000033	
8, 750	35, 000	.001067	.000134	.000033	0.	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001133	.000033	....	....	
9, 500	38, 000	.001200	.000067	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	.000033	0.	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001433	.000033	.000033	0.	
11, 500	46, 000	.001467	.000034	....	....	
11, 750	47, 000	.001533	.000066	....	....	Elastic limit.
12, 000	48, 000	.002200	.000667	....	....	
12, 250	49, 000	.003033	.000833	....	....	
12, 500	50, 000	.005367	.002334	.003433	.003400	
12, 750	51, 000	.005900	.000533	....	....	
13, 000	52, 000	.006600	.000700	....	....	
13, 250	53, 000	.007267	.000667	....	....	
13, 500	54, 000	.008667	.001400	....	....	
13, 750	55, 000	.010000	.001333	....	....	
14, 000	56, 000	.011233	.001232	....	....	
14, 250	57, 000	.011933	.000700	....	....	
14, 500	58, 000	.013000	.001067	....	....	
14, 750	59, 000	.014067	.001067	....	....	
15, 000	60, 000	.015367	.001300	....	....	
15, 500	62, 000	.017767	.002400	....	....	
16, 000	64, 000	.020400	.002633	....	....	
16, 500	66, 000	.022933	.002533	....	....	
17, 000	68, 000	.025767	.002834	....	....	
17, 500	70, 000	.029500	.003733	....	....	
18, 000	72, 000	.033000	.003500	....	....	
18, 500	74, 000	.037333	.004333	....	....	
19, 000	76, 000	.041667	.004334	....	....	
19, 500	78, 000	.047833	.006166	....	....	
20, 000	80, 000	.055600	.007767	....	....	
20, 500	82, 000	.0667	.0111	....	....	
21, 000	84, 000	.0933	.0266	....	....	
21, 500	86, 000	.1333	.0400	....	....	Tensile strength.
19, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8566
Hardness	14.40
Tensile strength per square inch of original section....pounds..	86, 000
Elastic limit per square inch of original section....do ...	47, 000
Elongation per inch after rupture....inch..	0.2533
Elongation per inch under strain at elastic limit....do....	.001533
Reduction in diameter at point of rupture....do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	″.2 from middle of stem
Character of broken surface	silky, 70 per centum; fine granular, 30 per centum
Elongation of inch sections	″.20, ″.40*, .16

No. 757.

Marks, $\overset{8\ T_{8}}{M\ T_{2}\ O}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001100	.000133	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001333	.000066	....	....	
10,500	42,000	.001400	.000067	....	....	Elastic limit.
10,750	43,000	.003100	.001700	....	....	
11,000	44,000	.004133	.001033	....	....	
11,250	45,000	.005333	.001200	.003767	.003767	
11,500	46,000	.006667	.001334	....	....	
11,750	47,000	.007500	.000833	....	....	
12,000	48,000	.008833	.001333	....	....	
12,250	49,000	.009567	.000734	....	....	
12,500	50,000	.011267	.001700	.009367	.005600	
12,750	51,000	.012000	.000733	....	....	
13,000	52,000	.013133	.001133	....	....	
13,250	53,000	.013733	.000600	....	....	
13,500	54,000	.015033	.001300	....	....	
13,750	55,000	.016067	.001034	....	....	
14,000	56,000	.017433	.001366	....	....	
14,250	57,000	.018600	.001167	....	....	
14,500	58,000	.019933	.001333	....	....	
14,750	59,000	.020800	.000867	....	....	
15,000	60,000	.022500	.001700	....	....	
15,500	62,000	.025933	.003433	....	....	
16,000	64,000	.029033	.003100	....	....	
16,500	66,000	.032833	.003800	....	....	
17,000	68,000	.036733	.003900	....	....	
17,500	70,000	.041000	.004267	....	....	
18,000	72,000	.047000	.006000	....	....	
18,500	74,000	.054500	.007500	....	....	
19,000	76,000	.063333	.008833	....	....	
19,500	78,000	.075833	.012500	....	....	
20,000	80,000	.1067	.030867	....	....	
20,260	81,040	.1500	.0433	....	....	Tensile strength.
17,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81,040
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.2233
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		''.65 from neck
Character of broken surface		silky, with traces of fine granulation
Elongation of inch sections		''.42, ''.14, ''.11

No. 758.

Marks, $_{\text{M}}\overset{8}{\text{T}}_{8}$ $_{\text{T}_8}$ $_{\text{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	.0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000900	.000133	0.	....	
8, 750	35, 000	.001033	.000133	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001100	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001167	.000034	....	....	
10, 000	40, 000	.001200	.000033	.000033	.000033	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001267	.000034	....	....	
10, 750	43, 000	.001300	.000033	....	....	
11, 000	44, 000	.001367	.000067	....	....	
11, 250	45, 000	.001400	.000033	.000067	.000034	Elastic limit.
11, 500	46, 000	.003233	.001833	....	....	
11, 750	47, 000	.005233	.002000	....	....	
12, 000	48, 000	.906200	.000967	....	....	
12, 250	49, 000	.007667	.001467	....	....	
12, 500	50, 000	.009367	.001700	.007100	.007033	
12, 750	51, 000	.010133	.000766	....	....	
13, 000	52, 000	.011033	.000900	....	....	
13, 250	53, 000	.012433	.001400	....	....	
13, 500	54, 000	.134333	.001000	....	....	
13, 750	55, 000	.014333	.000900	....	....	
14, 000	56, 000	.015333	.001000	....	....	
14, 250	57, 000	.016000	.000667	....	....	
14, 500	58, 000	.017067	.001067	....	....	
14, 750	59, 000	.017833	.000766	....	....	
15, 000	60, 000	.019667	.001834	....	....	
15, 500	62, 000	.022333	.002666	....	....	
16, 000	64, 000	.025400	.003067	....	....	
16, 500	66, 000	.028667	.003267	....	....	
17, 000	68, 000	.032333	.003666	....	....	
17, 500	70, 000	.037733	.005400	....	....	
18, 000	72, 000	.042000	.004267	....	....	
18, 500	74, 000	.047833	.005833	....	....	
19, 000	76, 000	.055367	.007534	....	....	
19, 500	78, 000	.065500	.010133	....	....	
20, 000	80, 000	.079000	.0145	....	....	
20, 500	82, 000	.1267	.0477	....	....	
20, 530	82, 120	.1533	.0266	....	....	Tensile strength.
17, 100	....	....	....	....	....	Load at time of rupture.

General summary.

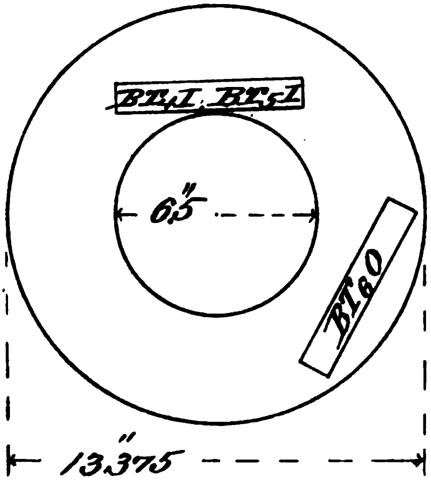
Tensile strength per square inch of original section	pounds..	82, 120
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2233
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.174
Reduction of area after rupture, per centum of original section		52. 2
Position of rupture		″.80 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.41*, ″.15, ″.11

8" Converted Rifle

Tube No. 8.

Additional specimens.

BT5I nearer the bottom than BT4I



No. 879.

Marks, $^{8\,T_8}_{B\,T_4\,I}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	0.	....	Elastic limit.
10, 250	41, 000	.001367	.000100	....	....	
10, 500	42, 000	.001667	.000300	....	....	
10, 750	43, 000	.002067	.000400	....	....	
11, 000	44, 000	.002767	.000700	....	....	
11, 250	45, 000	.003900	.001133	.002300	.002300	
11, 500	46, 000	.005167	.001267	....	....	
11, 750	47, 000	.005967	.000800	....	....	
12, 000	48, 000	.007067	.001100	....	....	
12, 250	49, 000	.008067	.001000	....	....	
12, 500	50, 000	.009267	.001200	.007400	.005400	
12, 750	51, 000	.009833	.000566	....	....	
13, 000	52, 000	.011000	.001167	....	....	
13, 250	53, 000	.012033	.001033	....	....	
13, 500	54, 000	.013600	.001567	....	....	
13, 750	55, 000	.015000	.001400	....	....	
14, 000	56, 000	.016000	.001000	....	....	
14, 250	57, 000	.017167	.001167	....	....	
14, 500	58, 000	.018667	.001500	....	....	
14, 750	59, 000	.019667	.001000	....	....	
15, 000	60, 000	.021333	.001666	....	....	
15, 500	62, 000	.024367	.003034	....	....	
16, 000	64, 000	.027500	.003133	....	....	
16, 500	66, 000	.031167	.003667	....	....	
17, 000	68, 000	.035533	.004366	....	....	
17, 500	70, 000	.040667	.005134	....	....	
18, 000	72, 000	.046667	.006000	....	....	
18, 500	74, 000	.053667	.007000	....	....	
19, 000	76, 000	.063000	.009333	....	....	
19, 500	78, 000	.077000	.014000	....	....	
20, 000	80, 000	.1067	.0297	....	....	
20, 040	80, 160	.1233	.0166	....	....	Tensile strength.
17, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80, 160
Elastic limit per square inch of original section	do ...	40, 000
Elongation per inch after rupture	inch..	0. 1700
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.123
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		".75 from neck
Character of broken surface		granular, 60 per centum; silky, 40 per centum
Elongation of inch sections		".33*, ".09 ".09

No. 880.

Marks, $^{B\,T_3}_{B\,T_3\,I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	....	....	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000033	.000033	
10,250	41,000	.001367	.000067	....	....	Elastic limit.
10,500	42,000	.001467	.000100	....	....	
10,750	43,000	.001633	.000166	....	....	
11,000	44,000	.002333	.000700	....	....	
11,250	45,000	.003333	.001000	.001833	.001800	
11,500	46,000	.004400	.001067	....	....	
11,750	47,000	.005233	.000933	....	....	
12,000	48,000	.006167	.000834	....	....	
12,250	49,000	.007400	.001233	....	....	
12,500	50,000	.008533	.001133	.006667	.004834	
12,750	51,000	.009333	.000800	....	....	
13,000	52,000	.010333	.001000	....	....	
13,250	53,000	.012000	.001667	....	....	
13,500	54,000	.013533	.001533	....	....	
13,750	55,000	.014333	.000800	....	....	
14,000	56,000	.015000	.000667	....	....	
14,250	57,000	.016000	.001000	....	....	
14,500	58,000	.017833	.001833	....	....	
14,750	59,000	.018933	.001100	....	....	
15,000	60,000	.020000	.001067	....	....	
15,500	62,000	.023167	.003167	....	....	
16,000	64,000	.026667	.003500	....	....	
16,500	66,000	.029667	.003000	....	....	
17,000	68,000	.034667	.005000	....	....	
17,500	70,000	.039000	.004333	....	....	
18,000	72,000	.044500	.005500	....	....	
18,500	74,000	.050600	.006100	....	....	
19,000	76,000	.059667	.009067	....	....	
19,500	78,000	.071667	.012000	....	....	
20,000	80,000	.1033	.031633	....	....	
20,020	80,080	.1167	.0134	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	80,080
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.1700
Elongation per inch under strain at eleastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″ from neck, oblique
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.10, ″.09

No. 881.

Marks, $_{B}{}^{8\,T_8}_{T_8\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	Elastic limit.
10,000	40,000	.002967	.001734	.001800	.001800	
10,250	41,000	.004467	.001500	....	....	
10,500	42,000	.006000	.001533	....	....	
10,750	43,000	.007333	.001333	....	....	
11,000	44,000	.008433	.001100	....	....	
11,250	45,000	.009333	.000900	.007567	.005767	
11,500	46,000	.011000	.001667	....	....	
11,750	47,000	.012367	.001367	....	....	
12,000	48,000	.014167	.001800	....	....	
12,250	49,000	.015000	.000833	....	....	
12,500	50,000	.015933	.000933	.013967	.006400	
12,750	51,000	.016233	.000300	....	....	
13,000	52,000	.016767	.000534	....	....	
13,250	53,000	.017867	.001100	....	....	
13,500	54,000	.019333	.001466	....	....	
13,750	55,000	.020400	.001067	....	....	
14,000	56,000	.022167	.001767	....	....	
14,250	57,000	.024000	.001833	....	....	
14,500	58,000	.025333	.001333	....	....	
14,750	59,000	.027000	.001667	....	....	
15,000	60,000	.028833	.001833	....	....	
15,500	62,000	.032333	.003500	....	....	
16,000	64,000	.037000	.004667	....	....	
16,500	66,000	.043333	.006333	....	....	
17,000	68,000	.049500	.006167	....	....	
17,500	70,000	.050000	.006500	....	....	
18,000	72,000	.061167	.008167	....	....	
18,500	74,000	.0800	.015833	....	....	
19,000	76,000	.0967	.0167	....	....	
19,480	77,920	.1533	.0566	....	....	Tensile strength.
16,600	....	....	....	....	....	Load at time of rupture.

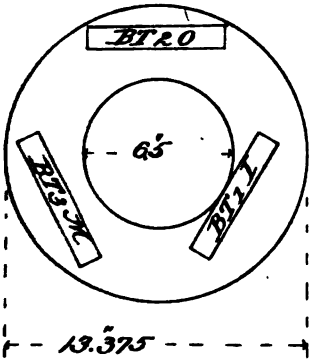
General summary.

Tensile strength per square inch of original section	pounds..	77,920
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	.02367
Elongation per inch under strain at elastic limit	do....	0.01233
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".48*, ".15, ".13

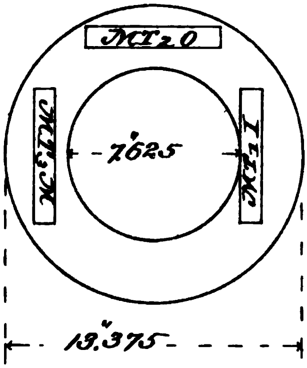
8" Converted Rifle

Tube No. 9

Breech



Muzzle



TUBE No. 9.—8″ *Converted Rifle.*

No. 891.

Marks, $\overset{8\ T^{9}}{B\ T_{1}\ I}$
Diameter, ″.564.
Sectional area, .25.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	.000033	.000033	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	.000067	.000067	Elastic limit.
11,500	46,000	.003933	.002500	....	....	
11,750	47,000	.005933	.002000	....	....	
12,000	48,000	.007400	.001467	....	....	
12,250	49,000	.008333	.000933	....	....	
12,500	50,000	.009167	.000834	.007267	.007200	
12,750	51,000	.009667	.000500	....	....	
13,000	52,000	.010400	.000783	....	....	
13,250	53,000	.011667	.001267	....	....	
13,500	54,000	.013167	.001500	....	....	
13,750	55,000	.014333	.001166	....	....	
14,000	56,000	.015333	.001000	....	....	
14,250	57,000	.017000	.001667	....	....	
14,500	58,000	.018333	.001333	....	....	
14,750	59,000	.019667	.001334	....	....	
15,000	60,000	.020667	.001000	....	....	
15,500	62,000	.024333	.003666	....	....	
16,000	64,000	.027167	.002834	....	....	
16,500	66,000	.030333	.003166	....	....	
17,000	68,000	.035333	.005000	....	....	
17,500	70,000	.040667	.005334	....	....	
18,000	72,000	.047500	.006833	....	....	
18,500	74,000	.055000	.007500	....	....	
19,000	76,000	.063000	.008000	....	....	
19,500	78,000	.072000	.009000	....	....	
20,000	80,000	.0967	.0247	....	....	
20,290	81,160	.1467	.0500	....	....	Tensile strength.
17,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8528
Hardness		12.60
Tensile strength per square inch of original section	pounds..	81,160
Elastic limit per square inch of original section	do ...	45,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.88 from neck
Character of broken surface		silky
Elongation of inch sections		″.89*, ″.18, ″.14

No. 896.

Marks, $\overset{S\,T_s}{M\,T_3\,M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001267	0.	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001367	.000067	....	....	
11,250	45,000	.001400	.000033	.000033	.000033	Elastic limit.
11,500	46,000	.001600	.000200	....	....	
11,750	47,000	.001733	.000133	....	....	
12,000	48,000	.003933	.002200	....	....	
12,250	49,000	.004833	.000900	....	....	
12,500	50,000	.006400	.001567	.004600	.004567	
12,750	51,000	.006900	.000500	....	....	
13,000	52,000	.007400	.000500	....	....	
13,250	53,000	.008267	.000867	....	....	
13,500	54,000	.000500	.001233	....	....	
13,750	55,000	.010500	.001000	....	....	
14,000	56,000	.011600	.001100	....	....	
14,250	57,000	.012500	.000900	....	....	
14,500	58,000	.013600	.001100	....	....	
14,750	59,000	.014667	.001067	....	....	
15,000	60,000	.016000	.001333	....	....	
15,500	62,000	.018167	.002167	....	....	
16,000	64,000	.020400	.002233	....	....	
16,500	66,000	.023500	.003100	....	....	
17,000	68,000	.026000	.002500	....	....	
17,500	70,000	.029667	.003667	....	....	
18,000	72,000	.033000	.003333	....	....	
18,500	74,000	.036667	.003667	....	....	
19,000	76,000	.041167	.004500	....	....	
19,500	78,000	.046500	.005333	....	....	
20,000	80,000	.055000	.008500	....	....	
20,500	82,000	.063333	.008333	....	....	
21,000	84,000	.0833	.019967	....	....	
21,500	86,000	.1033	.0200	....	....	
21,840	87,360	.1500	.0467	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 87,360

Elastic limit per square inch of original section....................................do.... 45,000

Elongation per inch after rupture....................................inch.. 0.2233

Elongation per inch under strain at elastic limit....................................do.... .001400

Reduction in diameter at point of rupture....................................do.... .144

Reduction in area after rupture, per centum of original section.................................... 44.6

Position of rupture....................................1″.05 from neck

Character of broken surface....................................silky

Elongation of inch sections....................................″.33*, ″.20, ″.14

TUBE No. 10.—8″ *Converted Rifle.*

No. 719.

Marks, ${}^{8\,T_{10}}_{B\,T_{1}\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5. 000	.000067	.000067	0.	....	
2, 500	10. 000	.000200	.000133	—.000033	— .000033	
3, 750	15, 000	.000300	.000100	—.000033	0.	
5, 000	20, 000	.000467	.000167	—.000033	0.	
6, 250	25, 000	.000633	.000166	—.000033	0.	
7, 500	30, 000	.000800	.000167	—.000033	0.	
8, 750	35, 000	.000967	.000167	—.000033	0.	
10, 000	40, 000	.001200	.000233	0.	.000033	
10, 250	41, 000	.001300	.000100	....	....	Elastic limit.
10, 500	42, 000	.001633	.000233	....	....	
10, 750	43, 000	.004733	.003100	....	....	
11, 000	44, 000	.006233	.001500	....	....	
11, 250	45, 000	.006933	.000700	.005200	.005200	
11, 500	46, 000	.007567	.000634	....	....	
11, 750	47, 000	.007933	.000366	....	....	
12, 000	48, 000	.009467	.001534	....	....	
12, 250	49. 000	.010333	.000866	....	....	
12, 500	50, 000	.011800	.001467	.009933	.004733	
12, 750	51, 000	.012367	.000567	....	....	
13, 000	52, 000	.013333	.000966	....	....	
13, 250	53, 000	.014400	.001067	....	....	
13, 500	54, 000	.016033	.001633	....	....	
13, 750	55, 000	.017167	.001134	....	....	
14, 000	56, 000	.018333	.001166	....	....	
14, 250	57, 000	.019933	.001600	....	....	
14, 500	58, 000	.021000	.001067	....	....	
14, 750	59, 000	.022400	.001400	....	....	
15, 000	60, 000	.024167	.001767	....	....	
15, 500	62, 000	.027400	.003233	....	....	
16, 000	64, 000	.030667	.003267	....	....	
16, 500	66, 000	.035167	.004500	....	....	
17, 000	68, 000	.039867	.004700	....	....	
17, 500	70, 000	.045333	.005466	....	....	
18, 000	72, 000	.051667	.006334	....	....	
18, 500	74, 000	.060667	.009000	....	....	
19, 000	76, 000	.071667	.011000	....	....	
19, 500	78, 000	.0900	.018333	....	....	
20, 000	80, 000	.1333	.0433	....	....	
20, 030	80, 120	.1567	.0234	....	....	Tensile strength.
17, 696	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8554
Hardness		11. 92
Tensile strength per square inch of original section	pounds..	80, 120
Elastic limit per square inch of original section	do....	41, 000
Elongation per inch after rupture	inch..	0. 2367
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		″.38*, ″.19, ″.14

No. 720.

Marks, $\overset{8\ T:0}{\mathrm{B\ T_2\ O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000300	.000100	0.	....	
5,000	20,000	.000500	.000200	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000900	.000233	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001167	.000067	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	Elastic limit.
11,000	44,000	.001500	.000133	....	....	
11,250	45,000	.004233	.002733	.002733	.002733	
11,500	46,000	.006667	.002434	....	....	
11,750	47,000	.007700	.001033	....	....	
12,000	48,000	.008000	.000300	....	....	
12,250	49,000	.008700	.000700	....	....	
12,500	50,000	.010400	.001700	.008467	.005734	
12,750	51,000	.011033	.000633	....	....	
13,000	52,000	.011700	.000667	....	....	
13,250	53,000	.012733	.001033	....	....	
13,500	54,000	.013933	.001200	....	....	
13,750	55,000	.015267	.001334	....	....	
14,000	56,000	.016600	.001333	....	....	
14,250	57,000	.018033	.001433	....	....	
14,500	58,000	.019500	.001467	....	....	
14,750	59,000	.020733	.001233	....	....	
15,000	60,000	.022200	.001467	....	....	
15,500	62,000	.025067	.002867	....	....	
16,000	64,000	.028833	.003766	....	....	
16,500	63,000	.032267	.003434	....	....	
17,000	68,000	.036167	.003900	....	....	
17,500	70,000	.041433	.005266	....	....	
18,000	72,000	.047000	.005567	....	....	
18,500	74,000	.053733	.006733	....	....	
19,000	76,000	.063667	.009934	....	....	
19,500	78,000	.078167	.014500	....	....	
20,000	80,000	.1000	.021833	....	....	
20,220	80,880	.1433	.0433	....	....	Tensile strength.
16,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,880
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.80 from neck
Character of broken surface		silky
Elongation of inch sections		′.42*, ″.17, ″.12

No. 721.

Marks, $\overset{8\,T_{10}}{B\,T_{2}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000000	.000200	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	.000033	.000033	
8,750	35,000	.001100	.000167	.000067	.000034	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001333	.000066	.000100	.000033	Elastic limit.
10,250	41,000	.001967	.000634	....	....	
10,500	42,000	.002633	.000666	....	....	
10,750	43,000	.003667	.001034	....	....	
11,000	44,000	.005933	.002266	....	....	
11,250	45,000	.007667	.001734	.006067	.005967	
11,500	46,000	.008300	.000633	....	....	
11,750	47,000	.008800	.000500	....	....	
12,000	48,000	.010000	.001200	....	....	
12,250	49,000	.011367	.001367	....	....	
12,500	50,000	.012467	.001100	.010600	.004533	
12,750	51,000	.012967	.000500	....	....	
13,000	52,000	.014000	.001033	....	....	
13,250	53,000	.015333	.001333	....	....	
13,500	54,000	.016900	.001567	....	....	
13,750	55,000	.018267	.001367	....	....	
14,000	56,000	.019567	.001300	....	....	
14,250	57,000	.020933	.001366	....	....	
14,500	58,000	.022300	.001367	....	....	
14,750	59,000	.023783	.001483	....	....	
15,000	60,000	.025583	.001800	....	....	
15,500	62,000	.029067	.003584	....	....	
16,000	64,000	.032833	.003766	....	....	
16,500	66,000	.037267	.004434	....	....	
17,000	68,000	.042333	.005066	....	....	
17,500	70,000	.048333	.006000	....	....	
18,000	72,000	.056000	.007667	....	....	
18,500	74,000	.065333	.009333	....	....	
19,000	76,000	.079000	.013667	....	....	
19,500	78,000	.1067	.0277	....	....	
19,580	78,320	.1300	.0233	....	....	Tensile strength.
17,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,320
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.40 from neck
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.11, ″.09

No. 722.

Marks, $\overset{8\,T_{10}}{M\,T_1\,I}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	—.000067	—.000067	
2, 500	10, 000	000133	.000066	—.000067	0.	
3, 750	15, 000	000267	.000134	—.000067	0.	
5, 000	20, 000	.000400	.000133	—.000067	0.	
6, 250	25, 000	.000567	.000167	—.000067	0.	
7, 500	30, 000	.000733	.000166	—.000067	0.	
8, 750	35, 000	.000967	.000234	....	....	
9, 000	36, 000	.001000	.000033	....	....	
9, 250	37, 000	001033	.000033	....	....	
9, 500	38, 000	.001067	.000034	....	....	
9, 750	39, 000	.001100	.000033	....	....	
10, 000	40, 000	.001133	.000033	—.000067	....	
10, 250	41, 000	.001200	.000067	....	....	
10, 500	42, 000	.001233	.000033	....	....	
10, 750	43, 000	.001267	.000034	....	....	
11, 000	44, 000	.001300	.000033	....	....	
11, 250	45, 000	.001367	.000067	0.	000067	
11, 500	46, 000	.001433	.000066	....	....	Elastic limit.
11, 750	47, 000	.002200	.000767	....	....	
12, 000	48, 000	.007067	.004867	....	....	
12, 250	49, 000	.007233	.000166	....	....	
12, 500	50, 000	.008033	.000800	.006233	.006233	
12, 750	51, 000	.008700	.000667	....	....	
13, 000	52, 000	.009167	.000467	....	....	
13, 250	53, 000	.010233	.001066	....	....	
13, 500	54, 000	.011367	.001134	....	....	
13, 750	55, 000	.012600	.001233	....	....	
14, 000	56, 000	.013900	.001300	....	....	
14, 250	57, 000	.015033	.001133	....	....	
14, 500	58, 000	.016167	.001134	....	....	
14, 750	59, 000	.017267	.001100	....	....	
15, 000	60, 000	.018600	.001333	....	....	
15, 500	62, 000	.021167	.002567	....	....	
16, 000	64, 000	.023667	.002500	....	....	
16, 500	66, 000	.027067	.003400	....	....	
17, 000	68, 000	.030500	.003433	....	....	
17, 500	70, 000	.034167	.003667	....	....	
18, 000	72, 000	.038667	.004500	....	....	
18, 500	74, 000	.044000	.005333	....	....	
19, 000	76, 000	.049700	.005700	....	....	
19, 500	78, 000	.057500	.007800	....	....	
20, 000	80, 000	.068333	.010833	....	....	
20, 500	82, 000	.0867	.018367	....	....	
21, 000	84, 000	.1167	.0300	....	....	
21, 090	84, 360	.1600	.0433	....	....	Tensile strength.
18, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8336
Hardness		13.53
Tensile strength per square inch of original section	pounds..	84, 360
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1''.40 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		''.22, ''.34*, ''.16

No. 723.

Marks, $\overset{8\ T_{10}}{M\ T_{2}\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000133	.000066	0.	....	
3,750	15,000	.000267	.000134	0.	....	
5,000	20,000	.000400	.000133	0.	....	
6,250	25,000	.000567	.000167	0.	....	
7,500	30,000	.000700	.000133	0.	....	
8,750	35,000	.000967	.000267	0.	....	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001067	0.	....	....	
10,000	40,000	.001100	.000033	0.	....	
10,250	41,000	.001133	.000033	....	....	
10,500	42,000	.001200	.000067	....	....	
10,750	43,000	.001233	.000033	....	....	
11,000	44,000	.001267	.000034	....	....	
11,250	45,000	.001300	.000033	0.	....	
11,500	46,000	.001367	.000067	....	....	
11,750	47,000	.001433	.000066	....	....	Elastic limit.
12,000	48,000	.003100	.001667	....	....	
12,250	49,000	.005267	.002167	....	....	
12,500	50,000	.006933	.001666	.005133	.005133	
12,750	51,000	.007467	.000534	....	....	
13,000	52,000	.007800	.000333	....	....	
13,250	53,000	.008433	.000633	....	....	
13,500	54,000	.009633	.001200	....	....	
13,750	55,000	.010633	.001000	....	....	
14,000	56,000	.011833	.001200	....	....	
14,250	57,000	.012800	.000967	....	....	
14,500	58,000	.013900	.001100	....	....	
14,750	59,000	.014833	.000933	....	....	
15,000	60,000	.016200	.001367	....	....	
15,500	62,000	.018567	.002367	....	....	
16,000	64,000	.020833	.002266	....	....	
16,500	66,000	.023400	.002567	....	....	
17,000	68,000	.026767	.003367	....	....	
17,500	70,000	.030667	.003900	....	....	
18,000	72,000	.034000	.003333	....	....	
18,500	74,000	.037667	.003667	....	....	
19,000	76,000	.042167	.004500	....	....	
19,500	78,000	.048067	.005900	....	....	
20,000	80,000	.055167	.007100	....	....	
20,500	82,000	.065667	.010500	....	....	
21,000	84,000	.0800	.014332	....	....	
21,500	86,000	.1033	.0233	....	....	
21,740	86,960	.1433	.0400	....	....	Tensile strength.
18,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	86,960
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.2567
Elongation per inch under strain of elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.30 from neck
Character of broken surface		silky
Elongation of inch sections		″.25, ″.36*, ″.16

No. 724.

Marks, $\overset{8\ T_{10}}{M\ T_3\ M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square Inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000100	0.	—.000033	— .000033	
3, 750	15, 000	.000167	.000067	—.000033	0.	
5, 000	20, 000	.000233	.000066	—.000067	— .000034	
6, 250	25, 000	.000500	.000267	—.000067	0.	
7, 500	30, 000	.000667	.000167	—.000067	0.	
8, 750	35, 000	.000833	.000166	—.000067	0.	
9, 000	36, 000	.000867	.000034	....	....	
9, 250	37, 000	.000900	.000033	....	....	
9. 500	38, 000	.000933	.000033	....	....	
9, 750	39, 000	.000967	.000034	....	....	
10, 000	40, 000	.001000	.000033	—.000067	0.	
10, 250	41, 000	.001033	.000033	....	....	
10, 500	42, 000	.001067	.000034	....	....	
10, 750	43, 000	.001100	.000033	....	....	
11, 000	44, 000	.001200	.000100	....	....	
11, 250	45, 000	.001233	.000033	—.000067	0.	
11, 500	46, 000	.001300	.000067	....	....	Elastic limit.
11, 750	47, 000	.003600	.002300	....	....	
12, 000	48, 000	.005000	.001400	....	....	
12, 250	49, 000	.006600	.001600	....	....	
12, 500	50, 000	.008033	.001433	.006267	.006334	
12, 750	51, 000	.008600	.000567	....	....	
13, 000	52, 000	.009367	.000767	....	....	
13, 250	53, 000	.010000	.000633	....	....	
13, 500	54, 000	.011167	.001167	....	....	
13, 750	55, 000	.012500	.001333	....	....	
14, 000	56, 000	.013667	.001167	....	....	
14, 250	57, 000	.014533	.000866	....	....	
14, 500	58, 000	.015500	.000967	....	....	
14, 750	59, 000	.016533	.001033	....	....	
15, 000	60, 000	.017733	.001200	....	....	
15, 500	62, 000	.020000	.002267	....	....	
16, 000	64, 000	.023167	.003167	....	....	
16, 500	66, 000	.026600	.003433	....	....	
17, 000	68, 000	.029733	.003133	....	....	
17, 500	70, 000	.033267	.003534	....	....	
18, 000	72, 000	.036667	.003400	....	....	
18, 500	74, 000	.041167	.004500	....	....	
19, 000	76, 000	.047333	.006166	....	....	
19, 500	78, 000	.053667	.006334	....	....	
20, 000	80, 000	.062333	.008666	....	....	
20, 500	82, 000	.074333	.012000	....	....	
21, 000	84, 000	.0933	.018067	....	....	
21, 380	85, 520	.1467	.0534	....	....	Tensile strength.
19, 000	....	....	....	....	....	Load at time of rupture.

General summary.

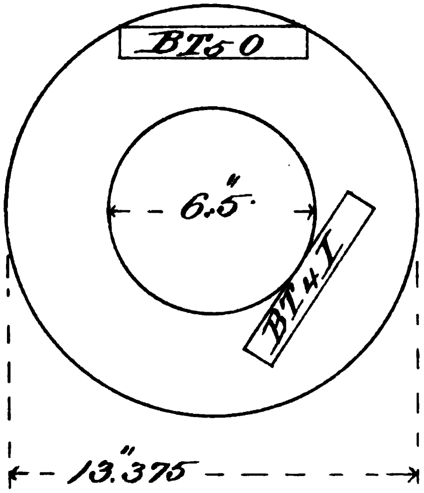
Tensile strength per square inch of original section	pounds..	85, 520
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0. 2267
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		".75 from neck
Character of broken surface		silky
Elongation of inch sections		".38*, ".18, ".12

8" Converted Rifle

Tube No. 10

Additional specimens.

Breech



S Ex 36 49 1

No. 790.

Marks, $^{8\,T_{10}}_{B\,T_4\,I}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000100	. 000100	0.		
2, 500	10, 000	. 000233	. 000133	0.		
3, 750	15, 000	. 000367	. 000134	0.		
5, 000	20, 000	. 000567	. 000200	0.		
6, 250	25, 000	. 000700	. 000133	0.		
7, 500	30, 000	. 000867	. 000167	0.		
8, .50	35, 000	. 001000	. 000133	0.		
9, 000	36, 000	.. 001033	. 000033			
9, 250	37, 000	. 001067	. 000034			
9, 500	38, 000	. 001100	. 000033			
9, 750	39, 000	. 001133	. 000033			
10, 000	40, 000	. 001167	. 000034	0.		
10, 250	41, 000	. 001200	. 000033			
10, 500	42, 000	. 001200	0.			
10, 750	43, 000	. 001233	. 000033			
11, 000	44, 000	. 001267	. 000034			
11, 250	45, 000	. 001300	. 000033	0.		Elastic limit.
11, 500	46, 000	. 001467	. 000167			
11, 750	47, 000	. 001933	. 000466			
12, 000	48, 000	. 002800	. 000867			
12, 250	49, 000	. 003500	. 000700			
12, 500	50, 000	. 005967	. 001467	. 004233	. 004233	
12, 750	51, 000	. 006600	. 000633			
13, 000	52, 000	. 007633	. 001033			
13, 250	53, 000	. 008467	. 000834			
13, 500	54, 000	. 009967	. 001500			
13, 750	55, 000	. 010800	. 000833			
14, 000	56, 000	. 012233	. 001433			
14, 250	57, 000	. 013333	. 001100			
14, 500	58, 000	. 014667	. 001334			
14, 750	59, 000	. 015700	. 001033			
15, 000	60, 000	. 017500	. 001800			
15, 500	62, 000	. 020133	. 002633			
16, 000	64, 000	. 023100	. 002967			
16, 500	66, 000	. 026833	. 003733			
17, 000	68, 000	. 030600	. 003767			
17, 500	70, 000	. 034533	. 003933			
18, 000	72, 000	. 039033	. 004500			
18, 500	74, 000	. 044733	. 005700			
19, 000	76, 000	. 052000	. 007267			
19, 500	78, 000	. 061167	. 000167			
20, 000	80, 000	. 073333	. 012166			
20, 500	82, 000	. 1033	. 020967			
20, 650	82, 600	. 1400	. 0367			Tensile strength.
17, 400						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82, 600
Elastic limit per square inch of original section	do ...	45, 000
Elongation per inch after rupture	inch..	0. 2133
Elongation per inch under strain at elastic limit	do....	. 001300
Reduction in diameter at point of rupture	do....	. 173
Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		".7 from neck
Character of broken surface		silky
Elongation of inch sections		".39*, ' 13, ",12

No. 791.

Marks, $\overset{8\,T_{10}}{B\,T_{5}\,O}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	.000033	.000033	
8, 750	35, 000	.001100	.000167	.000033	0.	
9, 000	36, 000	.001183	.000083	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	.000033	0.	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001367	.000067	....	....	
10, 750	43, 000	.001400	.000033	....	....	
11, 000	44, 000	.001500	.000100	....	....	Elastic limit.
11, 250	45, 000	.001800	.000300	.000400	.000367	
11, 500	46, 000	.003600	.001800	....	....	
11, 750	47, 000	.004067	.000467	....	....	
12, 000	48, 000	.005267	.001200	....	....	
12, 250	49, 000	.006167	.000900	....	....	
12, 500	50, 000	.007167	.001000	.005467	.005067	
12, 750	51, 000	.007733	.000566	....	....	
13, 000	52, 000	.008400	.000667	....	....	
13, 250	53, 000	.009567	.001167	....	....	
13. 500	54, 000	.010867	.001300	....	....	
13, 750	55, 000	.012000	.001133	....	....	
14, 000	56, 000	.013000	.001000	....	....	
14, 250	57, 000	.014000	.001000	....	....	
14, 500	58, 000	.015000	.001000	....	....	
14, 750	59, 000	.016000	.001000	....	....	
15, 000	60, 000	.017267	.001267	....	....	
15, 500	62, 000	.019733	.002466	....	....	
16, 000	64, 000	.022600	.002867	....	....	
16, 500	66, 000	.026000	.003400	....	....	
17, 000	68, 000	.029000	.003000	....	....	
17, 500	70, 000	.032067	.003067	....	....	
18, 000	72, 000	.036033	.003966	....	....	
18, 500	74, 000	.040700	.004667	....	....	
19, 000	76, 000	.046000	.005300	....	....	
19, 500	78, 000	.053267	.007267	....	....	
20, 000	80, 000	.061667	.008400	....	....	
20, 500	82, 000	.073667	.012000	....	....	
21, 000	84, 000	.0933	.019633	....	....	
21, 290	85, 160	.1367	.0434	....	....	Tensile strength.
18, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85, 160
Elastic limit per square inch of original section	do....	44, 000
Elongation per inch after rupture	inch..	0. 2367
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.153
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		1″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.26, ″.11

TUBE No. 11.—8″ *Converted Rifle.*

No. 775.

Marks, $\overset{8\ T_{II}}{B\ T,\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	0.		
2,500	10,000	.000200	.000167	0.		
3,750	15,000	.000367	.000167	0.		
5,000	20,000	.000567	.000200	0.		
6,250	25,000	.000700	.000133	0.		
7,500	30,000	.000867	.000167	0.		
8,750	35,000	.001033	.000166	0.		
9,000	36,000	.001033	0.			
9,250	37,000	.001067	.000034			
9,500	38,000	.001100	.000033			
9,750	39,000	.001133	.000033			
10,000	40,000	.001167	.000034	0.		
10,250	41,000	.001233	.000066			
10,500	42,000	.001300	.000067			
10,750	43,000	.001333	.000033			Elastic limit.
11,000	44,000	.001500	.000167			
11,250	45,000	.002033	.000533	.000600	.000600	
11,500	46,000	.003133	.001100			
11,750	47,000	.003933	.000800			
12,000	48,000	.005167	.001234			
12,250	49,000	.006167	.001000			
12,500	50,000	.007333	.001166	.005567	.004967	
12,750	51,000	.007933	.000600			
13,000	52,000	.009000	.001067			
13,250	53,000	.010667	.001667			
13,500	54,000	.011600	.000933			
13,750	55,000	.013000	.001400			
14,000	56,000	.014133	.001133			
14,250	57,000	.014833	.000700			
14,500	58,000	.016300	.001467			
14,750	59,000	.017400	.001100			
15,000	60,000	.019000	.001600			
15,500	62,000	.021667	.002667			
16,000	64,000	.025133	.003466			
16,500	66,000	.028700	.003567			
17,000	68,000	.032267	.003567			
17,500	70,000	.036833	.004566			
18,000	72,000	.042167	.006334			
18,500	74,000	.048767	.006600			
19,000	76,000	.057667	.008900			
19,500	78,000	.067667	.010000			
20,000	80,000	.0967	.029033			
20,360	81,440	.1333	.0366			Tensile strength.
17,100						Load at time of rupture.

General summary.

Specific gravity		7.8539
Hardness		13.40
Tensile strength per square inch of original section	pounds..	81,440
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	.02233
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		40.7
Position of rupture		″.8 from neck
Character of broken surface		silky
Elongation of inch sections		″.41*, ″.15, ″.11

No. 776.

Marks, $\overset{8\ T_{11}}{B\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000067	.000067	
2,500	10,000	.000333	.000166	.000067	0.	
3,750	15,000	.000500	.000167	.000067	0.	
5,000	20,000	.000700	.000200	.000067	0.	
6,250	25,000	.000867	.000167	.000067	0.	
7,500	30,000	.001033	.000166	.000100	.000033	
8,750	35,000	.001167	.000134	.000100	0.	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000100	0.	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001533	.000066	.000167	.000067	Elastic limit.
11,500	46,000	.001933	.000400	....	....	
11,750	47,000	.002500	.000567	....	....	
12,000	48,000	.003667	.001167	....	....	
12,250	49,000	.004733	.001066	....	....	
12,500	50,000	.005033	.001200	.004133	.003966	
12,750	51,000	.006567	.000634	....	....	
13,000	52,000	.007067	.001100	....	....	
13,250	53,000	.008333	.000866	....	....	
13,500	54,000	.009733	.001200	....	....	
13,750	55,000	.010567	.000834	....	....	
14,000	56,000	.011833	.001266	....	....	
14,250	57,000	.012833	.001000	....	....	
14,500	58,000	.013833	.001000	....	....	
14,750	59,000	.014833	.001000	....	....	
15,000	60,000	.016300	.001467	....	....	
15,500	62,000	.018667	.002367	....	....	
16,000	64,000	.021267	.002600	....	....	
16,500	66,000	.024000	.002733	....	....	
17,000	68,000	.027267	.003267	....	....	
17,500	70,000	.030733	.003466	....	....	
18,000	72,000	.034667	.003934	....	....	
18,500	74,000	.039333	.004666	....	....	
19,000	76,000	.044667	.005334	....	....	
19,500	78,000	.051500	.006833	....	....	
20,000	80,000	.060333	.008833	....	....	
20,500	82,000	.072667	.012334	....	....	
21,000	84,000	.1000	.027333	....	....	
21,170	84,680	.1333	.0333	....	....	Tensile strength.
17,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section................................pounds.. 84,680
Elastic limit per square inch of original section...do.... 45,000
Elongation per inch after rupture...inch.. 0.2200
Elongation per inch under strain at elastic limit...do.... .001533
Reduction in diameter at point of rupture...do.... .184
Reduction in area after rupture, per centum of original section.................................. 54.6
Position of rupture ....at middle of stem
Character of broken surface ....silky
Elongation of inch sections.. ″.12, ″.43*, ″.11

No. 790.

Marks, $^{8\,T_{10}}_{B\,T_4\,I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000367	.000134	0.		
5,000	20,000	.000567	.000200	0.		
6,250	25,000	.000700	.000133	0.		
7,500	30,000	.000867	.000167	0.		
8,750	35,000	.001000	.000133	0.		
9,000	36,000	.001033	.000033			
9,250	37,000	.001067	.000034			
9,500	38,000	.001100	.000033			
9,750	39,000	.001133	.000033			
10,000	40,000	.001167	.000034	0.		
10,250	41,000	.001200	.000033			
10,500	42,000	.001200	0.			
10,750	43,000	.001233	.000033			
11,000	44,000	.001267	.000034			
11,250	45,000	.001300	.000033	0.		Elastic limit.
11,500	46,000	.001467	.000167			
11,750	47,000	.001933	.000466			
12,000	48,000	.002800	.000867			
12,250	49,000	.003500	.000700			
12,500	50,000	.005967	.001467	.004233	.004233	
12,750	51,000	.006600	.000633			
13,000	52,000	.007633	.001033			
13,250	53,000	.008467	.000834			
13,500	54,000	.009967	.001500			
13,750	55,000	.010800	.000833			
14,000	56,000	.012233	.001433			
14,250	57,000	.013333	.001100			
14,500	58,000	.014667	.001334			
14,750	59,000	.015700	.001033			
15,000	60,000	.017500	.001800			
15,500	62,000	.020133	.002633			
16,000	64,000	.023100	.002967			
16,500	66,000	.026833	.003733			
17,000	68,000	.030600	.003767			
17,500	70,000	.034533	.003933			
18,000	72,000	.039033	.004500			
18,500	74,000	.044733	.005700			
19,000	76,000	.052000	.007267			
19,500	78,000	.061167	.009167			
20,000	80,000	.073333	.012166			
20,500	82,000	.1033	.020967			
20,650	82,600	.1400	.0367			Tensile strength.
17,400						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82,600
Elastic limit per square inch of original section	do ...	45,000
Elongation per inch after rupture	inch..	0.2133
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.173
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.7 from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ′13, ″,12

No. 778.

Marks, $\genfrac{}{}{0pt}{}{8\,T_{11}}{M\,T_{1}\,I}$.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000267	.000134	0.		
3, 750	15, 000	.000400	.000133	0.		
5, 000	20, 000	.000633	.000233	0.		
6, 250	25, 000	.000767	.000134	0.		
7, 500	30, 000	.000967	.000200	0.		
8, 750	35, 000	.001100	.000133	0.		
9, 000	36, 000	.001133	.000033			
9, 250	37, 000	.001167	.000034			
9, 500	38, 000	.001200	.000033			
9, 750	39, 000	.001233	.000033			
10, 000	40, 000	.001233	0.	0.		
10, 250	41, 000	.001267	.000034			
10, 500	42, 000	.001333	.000066			Elastic limit.
10, 750	43, 000	.003933	.002600			
11, 000	44, 000	.005900	.001967			
11, 250	45, 000	.007167	.001267	.005567	.005567	
11, 500	46, 000	.008133	.000966			
11, 750	47, 000	.008767	.000634			
12, 000	48, 000	.010333	.001566			
12, 250	49, 000	.011167	.000834			
12, 500	50, 000	.012333	.001166	.010443	.004866	
12, 750	51, 000	.012900	.000567			
13, 000	52, 000	.014033	.001133			
13, 250	53, 000	.014967	.000934			
13, 500	54, 000	.016733	.001766			
13, 750	55, 000	.017700	.000967			
14, 000	56, 000	.018800	.001100			
14, 250	57, 000	.019933	.001133			
14, 500	58, 000	.021333	.001400			
14, 750	59, 000	.022667	.001334			
15, 000	60, 000	.024300	.001633			
15, 500	62, 000	.027267	.002967			
16, 000	64, 000	.030600	.003333			
16, 500	66, 000	.034500	.003900			
17, 000	68, 000	.038933	.004433			
17, 500	70, 000	.043667	.004734			
18, 000	72, 000	.049833	.006166			
18, 500	74, 000	.057500	.007667			
19, 000	76, 000	.066500	.009000			
19, 500	78, 000	.079000	.012500			
20, 000	80, 000	.1000	.0210			
20, 415	81, 660	.1567	.0567			Tensile strength.
17, 400						Load at time of rupture.

General summary.

Specific gravity	7. 8525
Hardness	12. 48
Tensile strength per square inch of original section ... pounds	81. 660
Elastic limit per square inch of original section ... do	42, 000
Elongation per inch after rupture ... inch	0. 2333
Elongation per inch under strain at elastic limit ... do	.001833
Reduction in diameter at point of rupture ... do	.164
Reduction in area after rupture, per centum of original section	49. 7
Position of rupture	″. 85 from neck
Character of broken surface	silky
Elongation of inch sections	″. 13, ″.16, ″.41*

No. 779.

Marks, $^{8\,T_{11}}_{M\,T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000200	.000133	—.000033	0.	
3,750	15,000	.000300	.000100	—.000033	0.	
5,000	20,000	.000467	.000167	—.000033	0.	
6,250	25,000	.000600	.000133	—.000033	0.	
7,500	30,000	.000767	.000167	—.000033	0.	
8,750	35,000	.000933	.000166	—.000033	0.	
9,000	36,000	.000967	.000034	....	....	
9,250	37,000	.001000	.000033	....	....	
9,500	38,000	.001033	.000033	....	....	
9,750	39,000	.001067	.000034	....	....	
10,000	40,000	.001100	.000033	—.000033	0.	Elastic limit.
10,250	41,000	.002600	.001500	....	....	
10,500	42,000	.003533	.000933	....	....	
10,750	43,000	.004200	.000667	....	....	
11,000	44,000	.006167	.001967	....	....	
11,250	45,000	.008033	.001866	.006467	.006500	
11,500	46,000	.009100	.001067	....	....	
11,750	47,000	.009633	.000533	....	....	
12,000	48,000	.010700	.001067	....	....	
12,250	49,000	.012000	.001300	....	....	
12,500	50,000	.012967	.000967	.011067	.004600	
12,750	51,000	.013767	.000800	....	....	
13,000	52,000	.014833	.001066	....	....	
13,250	53,000	.015733	.000900	....	....	
13,500	54,000	.017367	.001634	....	....	
13,750	55,000	.018400	.001033	....	....	
14,000	56,000	.019833	.001433	....	....	
14,250	57,000	.021067	.001234	....	....	
14,500	58,000	.022667	.001600	....	....	
14,750	59,000	.023933	.001266	....	....	
15,000	60,000	.025500	.001567	....	....	
15,500	62,000	.028933	.003433	....	....	
16,000	64,000	.032400	.003467	....	....	
16,500	66,000	.036500	.004100	....	....	
17,000	68,000	.040700	.004200	....	....	
17,500	70,000	.046600	.005900	....	....	
18,000	72,000	.053000	.006400	....	....	
18,500	74,000	.060500	.007500	....	....	
19,000	76,000	.072000	.011500	....	....	
19,500	78,000	.0933	.0213	....	....	
20,000	80,000	.1200	.0267	....	....	
20,150	80,600	.1533	.0333	....	....	Tensile strength.
17,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds.. 80,600
Elastic limit per square inch of original section....................do.... 40,000
Elongation per inch after rupture....................inch.. 0.2200
Elongation per inch under strain at elastic limit....................do.... .001100
Reduction in diameter at point of rupture....................do.... .164
Reduction in area after rupture, per centum of original section.................... 49.7
Position of rupture....................″.6 from neck
Character of broken surface......... silky; 50 per cent. of surface interspersed with fine granulation
Elongation of inch sections....................″.41*, ″.14, ″.11

No. 780.

Marks, $\overset{8\ T_{11}}{M\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	—.000033	—.000033	
2, 500	10, 000	.000167	.000100	—.000033	0.	
3, 750	15, 000	.000300	.000133	—.000033	0.	
5, 000	20, 000	.000467	.000167	—.000033	0.	
6, 250	25, 000	.000633	.000166	—.000033	0.	
7, 500	30, 000	.000800	.000167	—.000033	0.	
8, 750	35, 000	.000967	.000167	—.000033	0.	
9, 000	36, 000	.001000	.000033	....	....	
9, 250	37, 000	.001033	.000033	....	....	
9, 500	38, 000	.001067	.000034	....	....	
9, 750	39, 000	.001067	0.	....	....	
10, 000	40, 000	.001100	.000033	—.000033	0.	
10, 250	41, 000	.001167	.000067	....	....	
10, 500	42, 000	.001200	.000033	....	....	
10, 750	43, 000	.001233	.000033	....	....	
11, 000	44, 000	.001267	.000034	....	....	
11, 250	45, 000	.001300	.000033	—.000033	0.	Elastic limit.
11, 500	46, 000	.001700	.000400	....	....	
11, 750	47, 000	.002700	.001000	....	....	
12, 000	48, 000	.005067	.002367	....	....	
12, 250	49, 000	.005600	.000533	....	....	
12, 500	50, 000	.007433	.001833	.005600	.005633	
12, 750	51, 000	.007933	.000500	....	....	
13, 000	52, 000	.008533	.000600	....	....	
13, 250	53, 000	.009367	.000834	....	....	
13, 500	54, 000	.010600	.001233	....	....	
13, 750	55, 000	.011767	.001167	....	....	
14, 000	56, 000	.012833	.001066	....	....	
14, 250	57, 000	.013733	.000900	....	....	
14, 500	58, 000	.015067	.001334	....	....	
14, 750	59, 000	.016167	.001100	....	....	
15, 000	60, 000	.017433	.001266	....	....	
15, 500	62, 000	.020033	.002600	....	....	
16, 000	64, 000	.022833	.002800	....	....	
16, 500	66, 000	.026333	.003500	....	....	
17, 000	68, 000	.029833	.003500	....	....	
17, 500	70, 000	.033033	.003200	....	....	
18, 000	72, 000	.037167	.004134	....	....	
18, 500	74, 000	.042500	.005333	....	....	
19, 000	76, 000	.048333	.005833	....	....	
19, 500	78, 000	.055667	.007334	....	....	
20, 000	80, 000	.066167	.010500	....	....	
20, 500	82, 000	.082000	.015833	....	....	
21, 000	84, 000	.1233	.0413	....	....	
21, 040	84, 160	.1400	.0167	....	....	Tensile strength.
18, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	84, 160
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2433
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do...	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		1″. 2 from neck
Character of broken surface		silky
Elongation of inch sections		″. 14, ″. 26, ″. 33*

TUBE No. 12.—8″ *Converted Rifle.*

No. 759.

Marks, $\frac{8\ T\ 12}{B\ T\ 1}$ I
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000367	.000200	0.	....	
3,750	15,000	.000583	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000867	.000167	0.	....	
7,500	30,000	.001033	.000166	0.	....	
8,750	35,000	.001200	.000167	0.	....	
9,000	36,000	.001233	.000033	....	....	
9,250	37,000	.001267	.000034	....	....	
9,500	38,000	.001300	.000033	....	....	
9,750	39,000	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	0.	....	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	Elastic limit.
11,250	45,000	.001900	.000400	.000467	.000467	
11,500	46,000	.002767	.000867	....	....	
11,750	47,000	.003500	.000783	....	....	
12,000	48,000	.004833	.001333	....	....	
12,250	49,000	.006067	.001234	....	....	
12,500	50,000	.007467	.001400	.005567	.005100	
12,750	51,000	.008033	.000566	....	....	
13,000	52,000	.009067	.001034	....	....	
13,250	53,000	.010133	.001066	....	....	
13,500	54,000	.011500	.001307	....	....	
13,750	55,000	.012767	.001267	....	....	
14,000	56,000	.013800	.001033	....	....	
14,250	57,000	.014867	.001067	....	....	
14,500	58,000	.016367	.001500	....	....	
14,750	59,000	.017500	.001133	....	....	
15,000	60,000	.019100	.001600	....	....	
15,500	62,000	.021867	.002767	....	....	
16,000	64,000	.025167	.003300	....	....	
16,500	66,000	.028667	.003500	....	....	
17,000	68,000	.032733	.004066	....	....	
17,500	70,000	.037067	.004334	....	....	
18,000	72,000	.042033	.004966	....	....	
18,500	74,000	.048333	.006300	....	....	
19,000	76,000	.056000	.007667	....	....	
19,500	78,000	.066067	.010067	....	....	
20,000	80,000	.080000	.013933	....	....	
20,500	82,000	.1533	.0733	....	....	Tensile strength.
17,500	----------	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8553
Hardness		12.84
Tensile strength, per square inch of original section	pounds..	82,000
Elastic limit, per square inch of original section	do...	44,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do...	.001500
Reduction in diameter at point of rupture	do...	.153
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.38*, ″.13, ″.12

No. 760.

Marks, $\overset{8T_{12}}{BT_2O}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	0.	....	0.	....	
2, 500	10, 000	.000133	.000133	0.	....	
3, 750	15, 000	.000300	.000167	0.	....	
5, 000	20, 000	.000400	.000100	0.	....	
6, 250	25, 000	.000667	.000267	0.	....	
7, 500	30, 000	.000800	.000132	0.	....	
8, 750	35, 000	.000967	.000167	.000033	.000033	
9, 000	36, 000	.001000	.000033	....	....	
9, 250	37, 000	.001000	0.	....	....	
9, 500	38, 000	.001033	.000033	....	....	
9, 750	39, 000	.001100	.000067	....	....	
10, 000	40, 000	.001167	.000067	.000033	0.	
10, 250	41, 000	.001200	.000033	....	....	Elastic limit.
10, 500	42, 000	.001633	.000433	....	....	
10, 750	43, 000	.002467	.000834	....	....	
11, 000	44, 000	.003267	.000800	....	....	
11, 250	45, 000	.004433	.001166	.002933	.002900	
11, 500	46, 000	.005133	.000700	....	....	
11, 750	47, 000	.005933	.000800	....	....	
12, 000	48, 000	.007267	.001334	....	....	
12, 250	49, 000	.008367	.001100	....	....	
12, 500	50, 000	.009667	.001300	.007800	.004867	
12, 750	51, 000	.010867	.001200	....	....	
13, 000	52, 000	.012000	.001133	....	....	
13, 250	53, 000	.012733	.000733	....	....	
13, 500	54, 000	.014167	.001434	....	....	
13, 750	55, 000	.015333	.001166	....	....	
14, 000	56, 000	.016500	.001167	....	....	
14, 250	57, 000	.018000	.001500	....	....	
14, 500	58, 000	.019333	.001333	....	....	
14, 750	59, 000	.020400	.001067	....	....	
15, 000	60, 000	.022000	.001600	....	....	
15, 500	62, 000	.025000	.003000	....	....	
16, 000	64, 000	.028333	.003333	....	....	
16, 500	66, 000	.032333	.004000	....	....	
17, 000	68, 000	.036667	.004334	....	....	
17, 500	70, 000	.042333	.005666	....	....	
18, 000	72, 000	.048333	.006000	....	....	
18, 500	74, 000	.055667	.007334	....	....	
19, 000	76, 000	.064333	.008666	....	....	
19, 500	78, 000	.076667	.012334	....	....	
20, 000	80, 000	.1067	.030033	....	....	
20, 150	80, 600	.1633	.0556	....	....	Tensil strength.
16, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80, 600
Elastic limit per square inch of original section	do....	41, 000
Elongation per inch after rupture	inch..	0. 2233
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.183
Reduction in area after rupture, per centum of original section		54. 6
Position of rupture		1" from neck
Character of broken surface		silky
Elongation of inch sections		".40*, ".19, ".08

No. 761.

Marks, $\overset{8\ T_{12}}{B\ T_3\ M}$

Diameter, ''.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000633	.000233	0.	....	
6,250	25,000	.000733	.000100	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001200	.000067	....	....	Elastic limit.
10,000	40,000	.001333	.000133	.000100	.000100	
10,250	41,000	.002167	.000834	....	....	
10,500	42,000	.002800	.000633	....	....	
10,750	43,000	.004333	.001533	....	....	
11,000	44,000	.005333	.001000	....	....	
11,250	45,000	.006333	.001000	.004667	.004567	
11,500	46,000	.007400	.001067	....	....	
11,750	47,000	.009667	.002267	....	....	
12,000	48,000	.011000	.001333	....	....	
12,250	49,000	.012000	.001000	....	....	
12,500	50,000	.013000	.001000	.011207	.006600	
12,750	51,000	.013667	.000667	....	....	
13,000	52,000	.014000	.000333	....	....	
13,250	53,000	.015000	.001000	....	....	
13,500	54,000	.016667	.001667	....	....	
13,750	55,000	.017667	.001000	....	....	
14,000	56,000	.019167	.001500	....	....	
14,250	57,000	.020500	.001333	....	....	
14,500	58,000	.022000	.001500	....	....	
14,750	59,000	.023667	.001667	....	....	
15,000	60,000	.025333	.001666	....	....	
15,500	62,000	.029000	.003667	....	....	
16,000	64,000	.032333	.003333	....	....	
16,500	66,000	.037000	.004667	....	....	
17,000	68,000	.041667	.004667	....	....	
17,500	70,000	.047333	.005666	....	....	
18,000	72,000	.055333	.008000	....	....	
18,500	74,000	.065000	.009667	....	....	
19,000	76,000	.076000	.011000	....	....	
19,500	78,000	.1000	.0240	....	....	
19,820	79,280	.1533	.0533	....	....	Tensile strength.
16,900	....	....	....	....	....	Load at time of ruptur

General summary.

Tensile strength per square inch of original section ....pounds.. 7

Elastic limit per square inch of original section ....do.... 3

Elongation per inch after rupture ....inch.. 0.

Elongation per inch under strain at elastic limit ....do.... .0

Reduction in diameter at point of rupture.................................... do ...

Reduction in area after rupture, per centum of original section ....

Position of rupture ....".9 from

Character of broken surface....................................

Elongation of inch sections ....".42*, ".10,

No. 762.

Marks, $\substack{8\,T_{19} \\ M\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000267	.000200	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000700	.000100	0.	....	
7,500	30,000	.000833	.000133	0.	....	
8,750	35,000	.000967	.000134	0.	....	
9,000	36,000	.001033	.000066	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001133	.000066	....	....	
9,750	39,000	.001200	.000067	....	....	
10,000	40,000	.001267	.000067	.000033	.000033	
10,250	41,000	.001300	.000033	....	....	Elastic limit.
10,500	42,000	.001733	.000433	....	....	
10,750	43,000	.002033	.000300	....	....	
11,000	44,000	.002667	.000634	....	....	
11,250	45,000	.003933	.001266	.002400	.002367	
11,500	46,000	.005333	.001400	....	....	
11,750	47,000	.006467	.001134	....	....	
12,000	48,000	.007667	.001200	....	....	
12,250	49,000	.008600	.000933	....	....	
12,500	50,000	.009867	.001267	.008000	.005600	
12,750	51,000	.010533	.000666	....	....	
13,000	52,000	.012000	.001467	....	....	
13,250	53,000	.013000	.001000	....	....	
13,500	54,000	.014167	.001167	....	....	
13,750	55,000	.015333	.001166	....	....	
14,000	56,000	.016667	.001334	....	....	
14,250	57,000	.017833	.001166	....	....	
14,500	58,000	.019167	.001334	....	....	
14,750	59,000	.020500	.001333	....	....	
15,000	60,000	.022000	.001500	....	....	
15,500	62,000	.025000	.003000	....	....	
16,000	64,000	.028333	.003333	....	....	
16,500	66,000	.032000	.003667	....	....	
17,000	68,000	.036500	.004500	....	....	
17,500	70,000	.041000	.004500	....	....	
18,000	72,000	.047000	.006000	....	....	
18,500	74,000	.054000	.007000	....	....	
19,000	76,000	.064333	.010333	....	....	
19,500	78,000	.078000	.013667	....	....	
20,000	80,000	.1067	.0267	....	....	
20,040	80,160	.1467	.0400	....	....	Tensile strength.

General summary.

Specific gravity		7.8352
Hardness		12.48
Tensile strength per square inch of original section	pounds..	80,160
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.8 from neck
Character of broken surface		silky; cracks developed on cylindrical surface of stem
Elongation of inch sections		″.34, ″.12, ″.08

No. 763.

Marks, $\overset{8\,T_{12}}{M\,T_2\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000500	.000133	0.	....	
6,250	25,000	.000700	.000200	0.	....	
7,500	30,000	.000800	.000100	0.	....	
8,750	35,000	.000933	.000133	0.	....	
9,000	36,000	.001000	.000067	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001133	.000033	.000033	.000033	
10,250	41,000	.001167	.000034	....	....	Elastic limit.
10,500	42,000	.002633	.001466	....	....	
10,750	43,000	.003933	.001300	....	....	
11,000	44,000	.006000	.002067	....	....	
11,250	45,000	.006867	.000867	.005233	.005200	
11,500	46,000	.008167	.001300	....	....	
11,750	47,000	.008700	.000533	....	....	
12,000	48,000	.010000	.001300	....	....	
12,250	49,000	.011000	.001000	....	....	
12,500	50,000	.012267	.001267	.010367	.005134	
12,750	51,000	.012933	.000666	....	....	
13,000	52,000	.013833	.000900	....	....	
13,250	53,000	.015333	.001500	....	....	
13,500	54,000	.017000	.001667	....	....	
13,750	55,000	.018000	.001000	....	....	
14,000	56,000	.019667	.001067	....	....	
14,250	57,000	.021000	.001333	....	....	
14,500	58,000	.022333	.001333	....	....	
14,750	59,000	.023667	.001334	....	....	
15,000	60,000	.025667	.002000	....	....	
15,500	62,000	.029000	.003333	....	....	
16,000	64,000	.032667	.003667	....	....	
16,500	66,000	.037333	.004666	....	....	
17,000	68,000	.042333	.005000	....	....	
17,500	70,000	.048000	.005667	....	....	
18,000	72,000	.055333	.007333	....	....	
18,500	74,000	.064667	.009334	....	....	
19,000	76,000	.079667	.015000	....	....	
19,500	78,000	.1000	.020333	....	....	
19,720	78,880	.1500	.0500	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,880
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001167
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.14, ″.14

No. 764.

Marks, $\overset{8\,T_{19}}{M\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	....	....	
2,500	10,000	.000233	.000133	....	....	
3,750	15,000	.000400	.000167	....	....	
5,000	20,000	.000633	.000233	....	....	
6,250	25,000	.000767	.000134	....	....	
7,500	30,000	.001000	.000233	....	....	
7,750	31,000	.001033	.000033	....	....	
8,000	32,000	.001100	.000067	....	....	
8,250	33,000	.001133	.000033	....	....	Elastic limit.
8,500	34,000	.001667	.000534	....	....	
8,750	35,000	.002700	.001033	.001400	.001400	
9,000	36,000	.004300	.001600	....	....	
9,250	37,000	.005400	.001100	....	....	
9,500	38,000	.006667	.001267	....	....	
9,750	39,000	.008267	.001600	....	....	
10,000	40,000	.009900	.001633	.008400	.007000	
10,250	41,000	.010667	.000767	....	....	
10,500	42,000	.011800	.001133	....	....	
10,750	43,000	.012900	.001100	....	....	
11,000	44,000	.014333	.001433	....	....	
11,250	45,000	.015700	.001367	.013933	.005533	
11,500	46,000	.017600	.001900	....	....	
11,750	47,000	.018133	.000533	....	....	
12,000	48,000	.019800	.001667	....	....	
12,250	49,000	.021800	.002000	....	....	
12,500	50,000	.024167	.002367	.022067	.008134	
12,750	51,000	.026000	.001833	....	....	
13,000	52,000	.027833	.001833	....	....	
13,250	53,000	.030000	.002167	....	....	
13,500	54,000	.032400	.002400	....	....	
13,750	55,000	.033633	.001233	....	....	
14,000	56,000	.037767	.004134	....	....	
14,250	57,000	.038667	.000900	....	....	
14,500	58,000	.043667	.005000	....	....	
14,750	59,000	.046167	.002500	....	....	
14,920	59,680	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	59,680
Elastic limit per square inch of original section..do....	33,000
Elongation per inch after rupture ....inch..	0.0467
Elongation per inch under strain at elastic limit..do....	.001133
Reduction in diameter at point of rupture..do....	.034
Reduction in area after rupture, per centum of original section	11.8
Position of rupture	″.50 from neck

Character of broken surface, granular; fractured surface contains blow-holes; numerous cracks developed along the cylindrical surface of stem.

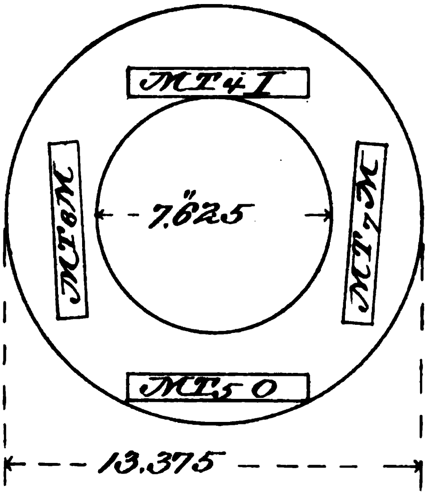
Elongation of inch sections ....″.07*, ″.04, ″.03

8" Converted Rifle

Tube No. 12

Additional specimens

Muzzle



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No. 948.

Marks, $\overset{8\ T_{12}}{M\ T_4\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	Elastic limit.
9, 500	38, 000	.002067	.000900	....	....	
9, 760	39, 000	.002400	.000333	....	....	
10, 000	40, 000	.002733	.000333	.001433	.001433	
10, 250	41, 000	.003167	.000434	....	....	
10, 500	42, 000	.004033	.000866	....	....	
10, 750	43, 000	.004933	.000900	....	....	
11, 000	44, 000	.006200	.001267	....	....	
11, 250	45, 000	.007400	.001200	.005800	.004367	
11, 500	46, 000	.008733	.001333	....	....	
11, 750	47, 000	.009567	.000834	....	....	
12, 000	48, 000	.011000	.001433	....	....	
12, 250	49, 000	.012000	.001000	....	....	
12, 500	50, 000	.013333	.001333	.011500	.005700	
12, 750	51, 000	.014333	.001000	....	....	
13, 000	52, 000	.015367	.001034	....	....	
13, 250	53, 000	.016933	.001566	....	....	
13, 500	54, 000	.018767	.001834	....	....	
13, 750	55, 000	.020167	.001400	....	....	
14, 000	56, 000	.021667	.001500	....	....	
14, 250	57, 000	.023333	.001666	....	....	
14, 500	58, 000	.025200	.001867	....	....	
14, 750	59, 000	.026833	.001633	....	....	
15, 000	60, 000	.029000	.002167	....	....	
15, 500	62, 000	.033333	.004333	....	....	
16, 000	64, 000	.038167	.004834	....	....	
16, 500	66, 000	.045367	.007200	....	....	
16, 800	67, 200	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..............pounds..	67, 200
Elastic limit per square inch of original section..............do....	37, 000
Elongation per inch after rupture..............inch..	0. 0533
Elongation per inch under strain at elastic limit..............do....	.001167
Reduction in diameter at point of rupture..............do....	.034
Reduction in area after rupture, per centum of original section..............	11. 8
Position of rupture..............	″.1 from neck

Character of broken surface, granular; blow-holes at point of rupture, also along stem in that vicinity

Elongation of inch sections..............″.09*, ″.04, ″.03

No. 949.

Marks, $\overset{8\ T_{12}}{M\ T_8\ O}$
Diameter, ″.564.
Sectional area, 25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	.000033	.000033	
7,500	30,000	.000933	.000166	.000033	0.	
8,750	35,000	.001133	.000200	.000067	.000034	Elastic limit.
9,000	36,000	.001233	.000100	....	....	
9,250	37,000	.001933	.000700	....	....	
9,500	38,000	.003600	.001667	....	....	
9,750	39,000	.005600	.002000	....	....	
10,000	40,000	.007133	.001533	.005733	.005666	
10,250	41,000	.007767	.000634	....	....	
10,500	42,000	.008333	.000566	....	....	
10,750	43,000	.009500	.001167	....	....	
11,000	44,000	.010667	.001167	....	....	
11,250	45,000	.011900	.001233	.010400	.004667	
11,500	46,000	.013600	.001700	....	....	
11,750	47,000	.014367	.000767	....	....	
12,000	48,000	.015667	.001300	....	....	
12,250	49,000	.016833	.001166	....	....	
12,500	50,000	.018533	.001700	.010600	.066200	
12,750	51,000	.019867	.001334	....	....	
13,000	52,000	.021167	.001300	....	....	
13,250	53,000	.022667	.001500	....	....	
13,500	54,000	.024833	.002166	....	....	
13,750	55,000	.026500	.001667	....	....	
14,000	56,000	.028200	.001700	....	....	
14,250	57,000	.030133	.001933	....	....	
14,500	58,000	.032667	.002534	....	....	
14,750	59,000	.034500	.001833	....	....	
15,000	60,000	.037867	.003367	....	....	
15,500	62,000	.0433	.005433	....	....	
16,000	64,000	.0467	.0034	....	....	
16,500	66,000	.0600	.0133	....	....	
16,750	67,000	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds..	67,000
Elastic limit per square inch of original section....................do....	35,000
Elongation per inch after rupture....................inch..	0.0700
Elongation per inch under strain at elastic limit....................do....	.001133
Reduction in diameter at point of rupture....................do....	.034
Reduction in area after rupture, per centum of original section....................	11.8
Position of rupture....................	″.05 from middle of stem
Character of broken surface.....	granular 90 per cent., dull silky 10 per cent.; fractured at a blow-hole
Elongation of inch sections....................	″.05, ″.09*, ″.07

No. 950.

Marks, $\overset{8\ T_{12}}{M\ T_4\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000433	.000133	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.001000	.000233	.000067	.000067	
7, 750	31, 000	.001033	.000033	....	....	
8, 000	32, 000	.001100	.000067	....	....	Elastic limit.
8, 250	33, 000	.001267	.000167	....	....	
8, 500	34, 000	.001667	.000400	....	....	
8, 750	35, 000	.002733	.001066	.001533	.001466	
9, 000	36, 000	.003400	.000667	....	....	
9, 250	37, 000	.004400	.001000	....	....	
9, 500	38, 000	.006133	.001933	....	....	
9, 750	39, 000	.007867	.001534	....	....	
10, 000	40, 000	.000767	.001900	.008133	.006600	
10, 250	41, 000	.010400	.000633	....	....	
10, 500	42, 000	.011367	.000967	....	....	
10, 750	43, 000	.012500	.001133	....	....	
11, 000	44, 000	.014333	.001833	....	....	
11, 250	45, 000	.015833	.001500	.013967	.005834	
11, 500	46, 000	.016867	.001034	....	....	
11, 750	47, 000	.017800	.000933	....	....	
12, 000	48, 000	.020500	.002700	....	....	
12, 500	50, 000	.0217	.0012	....	....	
13, 000	52, 000	.0250	.0033	....	....	
13, 500	54, 000	.0300	.0050	....	....	
14, 000	56, 000	.0350	.0050	....	....	
14, 500	58, 000	.0400	.0050	....	....	
14, 640	58, 500	....	....	....	....	Tensile strength,

General summary.

Tensile strength per square inch of original section	pounds..	58, 560
Elastic limit per square inch of original section	do....	32, 000
Elongation per inch after rupture	inch..	0. 0000
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.034
Reduction in area after rupture, per centum of original section		11. 8
Position of rupture		″.3 from neck
Character of broken surface		granular 50 per cent., dull flaky 50 per cent.
Elongation of inch sections		″.11*, ″.04, ″03

No. 951.

Marks, $^{8\ T_{12}}_{M\ T_7\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	.000033	.000033	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000033	0.	
6,250	25,000	.000833	.000166	.000067	.000034	
7,500	30,000	.000967	.000134	.000067	0.	
8,750	35,000	.001133	.000166	.000067	0.	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	Elastic limit.
10,000	40,000	.001500	.000232	.000167	.000100	
10,250	41,000	.001633	.000133	....	....	
10,500	42,000	.002267	.000634	....	....	
10,750	43,000	.003167	.000900	....	....	
11,000	44,000	.005000	.001833	....	....	
11,250	45,000	.005767	.000767	.004300	.004183	
11,500	46,000	.007067	.001300	....	....	
11,750	47,000	.007767	.000700	....	....	
12,000	48,000	.008733	.000966	....	....	
12,250	49,000	.009833	.001100	....	....	
12,500	50,000	.010967	.001134	.009067	.004767	
12,750	51,000	.011667	.000700	....	....	
13,000	52,000	.012667	.001000	....	....	
13,250	53,000	.013767	.001100	....	....	
13,500	54,000	.015233	.001466	....	....	
13,750	55,000	.016500	.001267	....	....	
14,000	56,000	.017767	.001267	....	....	
14,250	57,000	.019400	.001633	....	....	
14,500	58,000	.020400	.001000	....	....	
14,750	59,000	.021667	.001267	....	....	
15,000	60,000	.023333	.001666	....	....	
15,500	62,000	.0267	.003367	....	....	
16,000	64,000	.0300	.0033	....	....	
16,500	66,000	.0333	.0033	....	....	
17,000	68,000	.0367	.0034	....	....	
17,500	70,000	.0400	.0033	....	....	
18,000	72,000	.0467	.0067	....	....	
18,500	74,000	.0567	.0100	....	....	
19,000	76,000	.0633	.0066	....	....	
19,500	78,000	.0767	.0134	....	....	
20,000	80,000	.1233	.0466	....	....	
20,050	80,200	.1533	.0300	....	....	Tensile strength.
17 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,200
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.9 from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ″.16, ″.13

TUBE No. 13.—8" *Converted Rifle.*

No. 725.

Marks, $\overset{8\ Tu}{B\ T,\ I}$
Diameter ".564.
Sectional area .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.0	....	
2,500	10,000	.000333	.000166	.0	....	
3,750	15,000	.000433	.000100	.0	....	
5,000	20,000	.000600	.000167	.0	....	
6,250	25,000	.000800	.000200	.0	....	
7,500	30,000	.000933	.000133	.0	....	
8,750	35,000	.001133	.000200	.0	....	
9,000	36,000	.001200	.000067	....	....	Elastic limit.
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001700	.000467	....	....	
9,750	39,000	.002333	.000633	....	....	
10,000	40,000	.004500	.002167	.003033	.003033	
10,250	41,000	.005267	.000767	....	....	
10,500	42,000	.006300	.001033	....	....	
10,750	43,000	.007000	.000700	....	....	
11,000	44,000	.008167	.001167	....	....	
11,250	45,000	.009767	.001600	.008033	.005000	
11,500	46,000	.010400	.000633	....	....	
11,750	47,000	.011267	.000867	....	....	
12,000	48,000	.012700	.001433	....	....	
12,250	49,000	.014033	.001333	....	....	
12,500	50,000	.015600	.001567	.013733	.005700	
12,750	51,000	.016500	.000900	....	....	
13,000	52,000	.017500	.001000	....	....	
13,250	53,000	.018667	.001167	....	....	
13,500	54,000	.020667	.002000	....	....	
13,750	55,000	.022367	.001700	....	....	
14,000	56,000	.024067	.001700	....	....	
14,250	57,000	.026000	.001933	....	....	
14,500	58,000	.027500	.001500	....	....	
14,750	59,000	.029500	.002000	....	....	
15,000	60,000	.032033	.002533	....	....	
15,500	62,000	.036667	.004634	....	....	
16,000	64,000	.041833	.005166	....	....	
16,500	66,000	.048067	.006234	....	....	
17,000	68,000	.055500	.007433	....	....	
17,500	70,000	.065667	.010167	....	....	
18,000	72,000	.080000	.014333	....	....	
18,500	74,000	.1067	.0267	....	....	
18,820	75,280	.1667	.0600	....	....	Tensile strength.

General summary.

Specific gravity		7.8584
Hardness		11.49
Tensile strength per square inch of original section	pounds	75,280
Elastic limit per square inch of original section	do	37,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001233
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		".80 from neck
Character of broken surface		silky
Elongation of inch sections		".35*, ".18, ".14

No. 726.

Marks, $\overset{8\,T_{13}}{B\,T_{3}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000267	.000167	0.	....	
3, 750	15, 000	.000367	.000100	0.	....	
5, 000	20, 000	.000467	.000100	0.	....	
6, 250	25, 000	.000667	.000200	0.	....	
7, 500	30, 000	.000833	.000166	0.	....	
8, 750	35, 000	.001000	.000167	0.	....	
9, 000	36, 000	.001067	.000067	....	....	
9, 250	37, 000	.001100	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001233	.000100	....	....	
10, 000	40, 000	.001433	.000200	.000167	.000167	Elastic limit.
10, 250	41, 000	.002233	.000800	....	....	
10, 500	42, 000	.002900	.000667	....	....	
10, 750	43, 000	.004100	.001200	....	....	
11, 000	44, 000	.005133	.001033	....	....	
11, 250	45, 000	.006267	.001134	.004567	.004400	
11, 500	46, 000	.006967	.000700	....	....	
11, 750	47, 000	.007733	.000766	....	....	
12, 000	48, 000	.009067	.001334	....	....	
12, 250	49, 000	.010267	.001200	....	....	
12, 500	50, 000	.011400	.001133	.009433	.004866	
12, 750	51, 000	.012067	.000667	....	....	
13, 000	52, 000	.013000	.000933	....	....	
13, 250	53, 000	.014267	.001267	....	....	
13, 500	54, 000	.015667	.001400	....	....	
13, 750	55, 000	.016833	.001166	....	....	
14, 000	56, 000	.018333	.001500	....	....	
14, 250	57, 000	.019667	.001334	....	....	
14, 500	58, 000	.021167	.001500	....	....	
14, 750	59, 000	.022667	.001500	....	....	
15, 000	60, 000	.024000	.001333	....	....	
15, 500	62, 000	.027000	.003000	....	....	
16, 000	64, 000	.030500	.003500	....	....	
16, 500	66, 000	.035000	.004500	....	....	
17, 000	68, 000	.040000	.005000	....	....	
17, 500	70, 000	.046167	.006167	....	....	
18, 000	72, 000	.053333	.007166	....	....	
18, 500	74, 000	.062500	.009167	....	....	
19, 000	76, 000	.073667	.011167	....	....	
19, 500	78, 000	.1033	.029633	....	....	
19, 710	78, 840	.1333	.0300	....	....	Tensile strength.
16, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds..	78, 840
Elastic limit per square inch of original section..........do....	40, 000
Elongation per inch after rupture..........inch..	0. 1467
Elongation per inch under strain at elastic limit..........do....	.001433
Reduction in diameter at point of rupture..........do....	.064
Reduction in area after rupture, per centum of original section..........	21. 4
Position of rupture..........	1″.10 from neck
Character of broken surface..........	granular, 70 per cent.; dull, flaky, at circumference, 30 per cent
Elongation of inch sections..........	″.18*, ″.16, ″.10

No. 727.

Marks, $\overset{8\,T_{13}}{B\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads. Total.	Applied loads. Per square inch.	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000407	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	.000033	.000033	
8,750	35,000	.001200	.000233	.000133	.000100	
9,000	36,000	.001267	.000067	....	....	
9,250	37,000	.001400	.000133	....	....	Elastic limit.
9,500	38,000	.001733	.000333	....	....	
9,750	39,000	.003700	.001967	....	....	
10,000	40,000	.004733	.001033	.003267	.003134	
10,250	41,000	.005600	.000867	....	....	
10,500	42,000	.006667	.001067	....	....	
10,750	43,000	.007467	.000800	....	....	
11,000	44,000	.008633	.001166	....	....	
11,250	45,000	.009567	.000934	.007800	.004533	
11,500	46,000	.010667	.001100	....	....	
11,750	47,000	.011667	.001000	....	....	
12,000	48,000	.012933	.001266	....	....	
12,250	49,000	.014000	.001067	....	....	
12,500	50,000	.015600	.001600	.013600	.005800	
12,750	51,000	.016433	.000833	....	....	
13,000	52,000	.017667	.001234	....	....	
13,250	53,000	.019333	.001666	....	....	
13,500	54,000	.021000	.001667	....	....	
13,750	55,000	.022500	.001500	....	....	
14,000	56,000	.024167	.001667	....	....	
14,250	57,000	.025833	.001666	....	....	
14,500	58,000	.027167	.001334	....	....	
14,750	59,000	.029033	.001866	....	....	
15,000	60,000	.031233	.002200	....	....	
15,500	62,000	.035500	.004267	....	....	
16,000	64,000	.040000	.004500	....	....	
16,500	66,000	.046367	.006367	....	....	
17,000	68,000	.053667	.007300	....	....	
17,500	70,000	.062000	.008333	....	....	
18,000	72,000	.074833	.012833	....	....	
18,500	74,000	.0967	.021867	....	....	
18,930	75,720	.1567	.0600	....	....	Tensile strength.
14,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds.. 75,720
Elastic limit per square inch of original section..........do.... 37,000
Elongation per inch after rupture..........inch.. 0.1067
Elongation per inch under strain at elastic limit..........do.... .001400
Reduction in diameter at point of rupture..........do.... .104
Reduction in area after rupture, per centum of original section.......... 33.5
Position of rupture..........″.20 from middle of steam
Character of broken surface..........granular, 50 per cent.; dull, flaky, 50 per cent.
Elongation of inch sections..........″.15, ″.28*, ″.16

No. 728.

Marks, $^{8\,T_{13}}$M. T_1 I
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2,500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000367	.000134	0.	....	
5, 000	20, 000	.000567	.000200	0.	....	
6, 250	25, 000	.000700	.000133	0.	....	
7, 500	30, 000	.000900	.000200	0.	....	
8, 750	35, 000	.001033	.000133	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001100	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001200	.000067	....	....	
10, 000	40, 000	.001267	.000067	0.	....	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	Elastic limit.
11, 250	45, 000	.001667	.000267	.000267	.000267	
11, 500	46, 000	.002133	.000466	....	....	
11, 750	47, 000	.002600	.000467	....	....	
12, 000	48, 000	.003600	.001000	....	....	
12, 250	49, 000	.005000	.001400	....	....	
12, 500	50, 000	.007000	.002000	.005133	.004866	
12, 750	51, 000	.007500	.000500	....	....	
13, 000	52, 000	.008267	.000767	....	....	
13, 250	53, 000	.009633	.001366	....	....	
13, 500	54, 000	.010667	.001034	....	....	
13, 750	55, 000	.011733	.001066	....	....	
14, 000	56, 000	.012967	.001234	....	....	
14, 250	57, 000	.014033	.001066	....	....	
14, 500	58, 000	.015400	.001367	....	....	
14, 750	59, 000	.016667	.001267	....	....	
15, 000	60, 000	.018033	.001366	....	....	
15, 500	62, 000	.020567	.002534	....	....	
16, 000	64, 000	.023167	.002600	....	....	
16, 500	66, 000	.026500	.003333	....	....	
17, 000	68, 000	.030000	.003500	....	....	
17, 500	70, 000	.033733	.003733	....	....	
18, 000	72, 000	.038167	.004434	....	....	
18, 500	74, 000	.043667	.005500	....	....	
19, 000	76, 000	.050000	.006333	....	....	
19, 500	78, 000	.057833	.007833	....	....	
20, 000	80, 000	.068333	.010500	....	....	
20, 500	82, 000	.0900	.021667	....	....	
20, 830	83, 320	.1400	.0500	....	....	Tensile strength.
17, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8549
Hardness		13. 59
Tensile strength per square inch of original section	pounds..	83, 820
Elastic limit per square inch of original section	do	44, 000
Elongation per inch after rupture	inch..	0. 2667
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		".20 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".19, ".45*, ".16

No. 729.

Marks, $\overset{8}{\text{M}}\,\overset{\text{T}_{12}}{\text{T}_2}\,\text{O}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,700	35,000	.001100	.000133	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001200	.000067	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001300	.000067	....	....	
10,000	40,000	.001367	.000067	.000133	.000133	Elastic limit.
10,250	41,000	.002500	.001133	....	....	
10,500	42,000	.003433	.000933	....	....	
10,750	43,000	.004500	.001067	....	....	
11,000	44,000	.005733	.021233	....	....	
11,250	45,000	.006433	.000700	.004833	.004700	
11,500	46,000	.007400	.000967	....	....	
11,750	47,000	.008433	.001033	....	....	
12,000	48,000	.009733	.001300	....	....	
12,250	49,000	.010633	.000900	....	....	
12,500	50,000	.011833	.001200	.006900	.005067	
12,750	51,000	.012600	.000767	....	....	
13,000	52,000	.013500	.000000	....	....	
13,250	53,000	.014467	.000967	....	....	
13,500	54,000	.015833	.001366	....	....	
13,750	55,000	.017267	.001434	....	....	
14,000	56,000	.018500	.001233	....	....	
14,250	57,000	.019633	.001133	....	....	
14,500	58,000	.021067	.001434	....	....	
14,750	59,000	.022333	.001266	....	....	
15,000	60,000	.024000	.001667	....	....	
15,500	62,000	.027333	.003333	....	....	
16,000	64,000	.030600	.003267	....	....	
16,500	66,000	.034500	.003900	....	....	
17,000	68,000	.038333	.003833	....	....	
17,500	70,000	.043933	.005600	....	....	
18,000	72,000	.051033	.007100	....	....	
18,500	74,000	.059500	.008467	....	....	
19,000	76,000	.072667	.013167	....	....	
19,500	78,000	.0900	.017333	....	....	
19,910	79,640	.1500	.0600	....	....	Tensile strength.
17,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,640
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001307
Reduction in diameter at point of rupture	do....	.153
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.1 from neck
Character of broken surface		silky
Elongation of inch sections		″.41*, ″.21, ″.13

No. 730.

Marks, $\overset{8\,T_{11}}{M\,T_{1}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000367	.000100	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.001000	.000167	0.	....	
9,000	36,000	.001000	0.	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001133	.000066	....	....	
10,000	40,000	.001200	.001067	0.	....	
10,250	41,000	.001267	.000067	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001367	.000067	....	....	Elastic limit.
11,000	44,000	.001967	.000600	....	....	
11,250	45,000	.003167	.001200	.001633	.001633	
11,500	46,000	.004767	.001600	....	....	
11,750	47,000	.005600	.000833	....	....	
12,000	48,000	.006333	.000733	....	....	
12,250	49,000	.007000	.000067	....	....	
12,500	50,000	.008600	.001600	.006800	.005167	
12,750	51,000	.009033	.000433	....	....	
13,000	52,000	.009933	.000900	....	....	
13,250	53,000	.010933	.001000	....	....	
13,500	54,000	.012033	.001100	....	....	
13,750	55,000	.012833	.000800	....	....	
14,000	56,000	.014167	.001334	....	....	
14,250	57,000	.015267	.001100	....	....	
14,500	58,000	.016667	.001400	....	....	
14,750	59,000	.017567	.000900	....	....	
15,000	60,000	.018967	.001400	....	....	
15,500	62,000	.022100	.003133	....	....	
16,000	64,000	.024600	.002500	....	....	
16,500	66,000	.027667	.003067	....	....	
17,000	68,000	.031400	.003733	....	....	
17,500	70,000	.035333	.003933	....	....	
18,000	72,000	.040000	.004667	....	....	
18,500	74,000	.045000	.005000	....	....	
19,000	76,000	.052000	.007000	....	....	
19,500	78,000	.059500	.007500	....	....	
20,000	80,000	.070000	.010500	....	....	
20,500	82,000	.0900	.0200	....	....	
20,000	83,000	.1567	.0667	....	....	Tensile strength.
17,700	....	....	....	....	....	Load at time of rupture.

General summary.

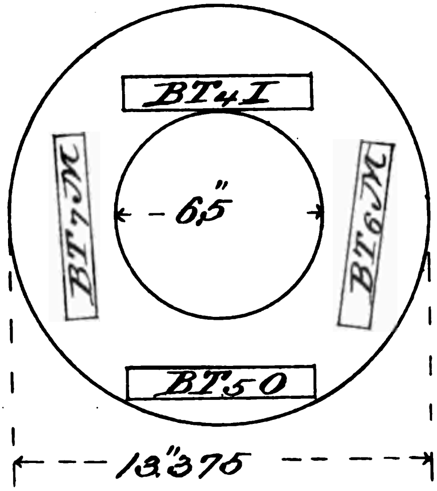
Tensile strength per square inch of original section	pounds..	83,000
Elastic limit per square inch of of original section	do....	43,000
Elongation per inch after rupture	inch..	.02667
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do. ..	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.20 from neck
Character of broken surface		silky
Elongation of inch sections		″.37*, ″.26″, .17

8" Converted Rifle

Tube No. 13

Additional specimens

Breech



S Ex 36 49 1

No. 864.

Marks, $^{8\,T_{12}}_{B\,T_4\,I}$
Diameter, ".560.
Sectional area, .246 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
246	1, 000	0.	0.	0.	0.	Initial load.
1, 230	5, 000	. 000100	. 000100	0.	....	
2, 460	10, 000	. 000267	. 000167	0.	....	
3, 690	15, 000	. 000433	. 000166	0.	....	
4, 920	20, 000	. 000600	. 000167	0.	....	
6, 150	25, 000	. 000767	. 000167	0.	....	
7, 380	30, 000	. 000933	. 000166	0.	....	
8, 610	35, 000	. 001067	. 000134	0.	....	
8, 856	36, 000	. 001100	. 000033	....	....	
9, 102	37, 000	. 001133	. 000033	....	....	
9, 348	38, 000	. 001167	. 000034	....	....	
9, 594	39, 000	. 001233	. 000066	....	....	Elastic limit.
9, 840	40, 000	. 001467	. 000234	. 000300	. 000300	
10, 086	41, 000	. 001800	. 000333	....	....	
10, 332	42, 000	. 002500	. 000700	....	....	
10, 578	43, 000	. 003600	. 001100	....	....	
10, 824	44, 000	. 005333	. 002033	....	....	
11, 070	45, 000	. 006000	. 000667	. 004733	. 004433	
11, 316	46, 000	. 007233	. 000933	....	....	
11, 562	47, 000	. 008100	. 000867	....	....	
11, 808	48, 000	. 009433	. 001333	....	....	
12, 054	49, 000	. 010500	. 001067	....	....	
12, 300	50, 000	. 011633	. 001133	. 009800	. 005067	
12, 546	51, 000	. 012333	. 000700	....	....	
12, 792	52, 000	. 013600	. 001267	....	....	
13, 038	53, 000	. 014833	. 001233	....	....	
13, 284	54, 000	. 016667	. 001834	....	....	
13, 530	55, 000	. 018167	. 001500	....	....	
13, 776	56, 000	. 019667	. 001500	....	....	
14, 022	57, 000	. 020833	. 001166	....	....	
14, 268	58, 000	. 022333	. 001500	....	....	
14, 514	59, 000	. 023667	. 001334	....	....	
14, 760	60, 000	. 025167	. 001500	....	....	
15, 252	62, 000	. 028933	. 003766	....	....	
15, 744	64, 000	. 032500	. 003567	....	....	
16, 236	66, 000	. 037333	. 004833	....	....	
16, 728	68, 000	. 043333	. 006000	....	....	
17, 220	70, 000	. 050000	. 006667	....	....	
17, 712	72, 000	. 058333	. 008333	....	....	
18, 204	74, 000	. 0667	. 008367	....	....	
18, 696	76, 000	. 0900	. 0233	....	....	
19, 188	78, 000	. 1367	. 0467	....	....	Tensile strength.
16, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	**pounds**	**78, 000**
Elastic limit per square inch of original section	**do**	**39, 000**
Elongation per inch after rupture	**inch**	**0. 2167**
Elongation per inch under strain at elastic limit	**do**	**. 001233**
Reduction in diameter at point of rupture	**do**	**. 160**
Reduction in area after rupture, per centum of original section		**48. 0**
Position of rupture		**".50 from neck**
Character of broken surface		**silky, with slight lamination**
Elongation of inch sections		**".39*, ".13, ".13**

No. 865.

Marks, $^{8\,T_{13}}_{B\,T_8\,O}$
Diameter, ″.562.
Sectional area, .248 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
248	1,000	0.	0.	0.	0.	Initial load.
1,240	5,000	.000133	.000133	0.	....	
2,480	10,000	.000300	.000167	0.	....	
3,720	15,000	.000433	.000133	0.	....	
4,960	20,000	.000600	.000167	0.	....	
6,200	25,000	.000767	.000167	0.	....	
7,440	30,000	.000933	.000166	.000033	.000033	
8,680	35,000	.001133	.000200	.000100	.000067	Elastic limit.
8,928	36,000	.001233	.000100	....	....	
9,176	37,000	.001367	.000134	....	....	
9,424	38,000	.002767	.001400	....	....	
9,672	39,000	.004567	.001800	....	....	
9,920	40,000	.005500	.000933	.004100	.004000	
10,168	41,000	.006333	.000833	....	....	
10,416	42,000	.007233	.000900	....	....	
10,664	43,000	.008233	.001000	....	....	
10,912	44,000	.009633	.001400	....	....	
11,160	45,000	.010500	.000867	.008833	.004783	
11,408	46,000	.011567	.001067	....	....	
11,656	47,000	.012500	.000933	....	....	
11,904	48,000	.013833	.001333	....	....	
12,152	49,000	.015000	.001167	....	....	
12,400	50,000	.016600	.001600	.014567	.005734	
12,648	51,000	.017600	.001000	....	....	
12,896	52,000	.018933	.001333	....	....	
13,144	53,000	.020000	.001067	....	....	
13,392	54,000	.021667	.001667	....	....	
13,640	55,000	.023600	.001933	....	....	
13,888	56,000	.025333	.001733	....	....	
14,136	57,000	.027267	.001934	....	....	
14,384	58,000	.028967	.001700	....	....	
14,632	59,000	.030667	.001700	....	....	
14,880	60,000	.032333	.001666	....	....	
15,376	62,000	.038000	.005667	....	....	
15,872	64,000	.042000	.004000	....	....	
16,368	66,000	.048000	.006000	....	....	
16,864	68,000	.055000	.007000	....	....	
17,360	70,000	.065167	.010167	....	....	
17,856	72,000	.0767	.011533	....	....	
18,352	74,000	.1000	.0233	....	....	
18,720	75,480	.1600	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 75,480
Elastic limit per square inch of original section...do ... 35,000
Elongation per inch after rupture...inch.. 0.2333
Elongation per inch under strain at elastic limit ....do.... .001133
Reduction in diameter at point of rupture ....do.... .132
Reduction in area after rupture, per centum of original section 41.5
Position of rupture ....″.4 from middle of stem
Character of broken service ....silky, slightly granular
Elongation of inch sections...″.26*, ″.31, ″.13

No. 866.

Marks, $\overset{8\,T_{13}}{B\,T_6\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	.000033	.000033	
3, 750	15, 000	.000467	.000134	.000033	0.	
5, 000	20, 000	.000600	.000133	.000033	0.	
6, 250	25, 000	.000767	.000167	.000067	.000034	
7, 500	30, 000	.000033	.000168	.000067	0.	
8, 750	35, 000	.001100	.000167	.000067	0.	Elastic limit.
9, 000	36, 000	001233	.000133	....	....	
9, 250	37, 000	.001633	.000400	....	....	
9, 500	38, 000	.003267	.001634	....	....	
9, 750	59, 000	.004467	.001200	....	....	
10, 000	40, 000	.005667	.001200	.004233	.004166	
10, 250	41, 000	.006133	.000466	....	....	
10, 500	42, 000	.007000	.000867	....	....	
10, 750	43, 000	.008067	.001067	....	....	
11, 000	44, 000	.009333	.001266	....	....	
11, 250	45, 000	.010333	.001000	.008767	.004534	
11, 500	46, 000	.011167	.000834	....	....	
11, 750	47, 000	.012000	.000833	....	....	
12, 000	48, 000	.013600	.001600	....	....	
12, 250	49, 000	.014667	.001067	....	....	
12, 500	50, 000	.016100	.001433	.014233	.005466	
12, 750	51, 000	.017167	.001067	....	....	
13, 000	52, 000	.018267	.001100	....	....	
13, 250	53, 000	.019567	.001300	....	....	
13, 500	54, 000	.021500	.001933	....	....	
13, 750	55, 000	.023500	.002000	....	....	
14, 000	56, 000	.025000	.001500	....	....	
14, 250	57, 000	.026500	.001500	....	....	
14, 500	58, 000	.028233	.001733	....	....	
14, 750	59, 000	.029733	.001500	....	....	
15, 000	60, 000	.031933	.002200	....	....	
15, 500	62, 000	.036667	.004734	....	....	
16, 000	64, 000	.041000	.004333	....	....	
16, 500	66, 000	.047667	.006667	....	....	
17, 000	68, 000	.055333	.007666	....	....	
17, 500	70, 000	.065333	.010000	....	....	
18, 000	72, 000	.0767	.011367	....	....	
18, 500	74, 000	.1067	.0300	....	....	
18, 680	74, 720	.1333	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	74, 720
Elastic limit per square inch of original section	do ...	35, 000
Elongation per inch after rupture	inch..	0. 1667
Elongation per inch under strain at elastic limit	do ...	.001100
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		″.4 from middle of stem
Character of broken surface, granular, 60 per centum; dull silky, 40 per centum; cracks opened in the cylindrical surface in the vicinity of the place of rupture.		
Elongation of inch sections		″.13, ″.27*, ″.10

No. 867.

Marks, $^{8\,T_{13}}_{B\,T_{7}\,M}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000733	.000133	0.	....	
7, 500	30, 000	.000900	.000167	.000033	.000033	
8, 750	35, 000	.001067	.000167	.000067	.000034	Elastic limit.
9, 000	36, 000	.001400	.000333	....	....	
9, 250	37, 000	.002300	.000900	....	....	
9, 500	38, 000	.005000	.002700	....	....	
9, 750	39, 000	.005933	.000933	....	....	
10, 000	40, 000	.006600	.000667	.005200	.005133	
10, 250	41, 000	.007667	.001067	....	....	
10, 500	42, 000	.008033	.000366	....	....	
10, 750	43, 000	.009333	.001300	....	....	
11, 000	44, 000	.010333	.001000	....	....	
11, 250	45, 000	.011500	.001167	.009933	.004733	
11, 500	46, 000	.013533	.002033	....	....	
11, 750	47, 000	.014133	.000600	....	....	
12, 000	48, 000	.015167	.001034	....	....	
12, 250	49, 000	.016500	.001333	....	....	
12, 500	50, 000	.018000	.001500	.016167	.006234	
12, 750	51, 000	.019000	.001000	....	....	
13, 000	52, 000	.020400	.001400	....	....	
13, 250	53, 000	.021667	.001267	....	....	
13, 500	54, 000	.023733	.002066	....	....	
13, 750	55, 000	.025500	.001767	....	....	
14, 000	56, 000	.027667	.002167	....	....	
14, 250	57, 000	.029167	.001500	....	....	
14, 500	58, 000	.031167	.002000	....	....	
14, 750	59, 000	.032667	.001500	....	....	
15, 000	60, 000	.035667	.003000	....	....	
15, 500	62, 000	.040500	.004833	....	....	
16, 000	64, 000	.046333	.005833	....	....	
16, 500	66, 000	.053000	.006667	....	....	
17, 000	68, 000	.062333	.009333	....	....	
17, 500	70, 000	.075667	.013334	....	....	
18, 000	72, 000	.0933	.017633	....	....	
18, 500	74, 000	.1300	.0367	....	....	
18, 000	74, 400	.1767	.0467	....	....	Tensile strength.
16, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	74, 400
Elastic limit per square inch of original section	do...	35, 000
Elongation per inch after rupture	inch..	0. 2667
Elongation per inch under strain at elastic limit	do...	.001067
Reduction in diameter at point of rupture	do...	.153
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		1" from neck
Character of broken surface		silky
Elongation of inch sections		".40* , ".24, ".16

TUBE No. 14.—8″ *Converted Rifle.*

No. 765.

Marks, $\overset{8\ T_{14}}{B\ T_1\ I}$
Diameter, **″.564.**
Sectional area, **.25** square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	—.000067	—.000067	
2,500	10,000	.000067	.000067	—.000067	0.	
3,750	15,000	.000133	.000066	—.000100	—.000033	
5,000	20,000	.000233	.000100	—.000167	—.000067	
6,250	25,000	.000433	.000200	—.000167	0.	
7,500	30,000	.000567	.000135	—.000167	0.	
8,750	35,000	.000733	.000166	—.000067	.000100	
9,000	36,000	.000767	.000034	....	....	
9,250	37,000	.000800	.000033	....	....	
9,500	38,000	.000833	.000033	....	....	
9,750	39,000	.000867	.000034	......	....	
10,000	40,000	.000900	.000033	—.000007	.0	Elastic limit.
10,250	41,000	.001167	.000267	....	....	
10,500	42,000	.001667	.000500	....	....	
10,750	43,000	.002133	.000466	....	....	
11,000	44,000	.003600	.001467	....	....	
11,250	45,000	.006633	.003033	.005067	.005134	
11,500	46,000	.007567	.000934	....	....	
11,750	47,000	.008467	.000900	....	....	
12,000	48,000	.009733	.001266	....	....	
12,250	49,000	.010767	.001034	....	....	
12,500	50,000	.012067	.001300	.010233	.005166	
12,750	51,000	.012767	.000700	....	....	
13,000	52,000	.014267	.001500	....	....	
13,250	53,000	.015567	.001300	....	....	
13,500	54,000	.017067	.001500	....	....	
13,750	55,000	.018400	.001333	....	....	
14,000	56,000	.019500	.001100	....	....	
14,250	57,000	.020800	.001300	....	....	
14,500	58,000	.022667	.001867	....	....	
14,750	59,000	.024333	.001666	....	....	
15,000	60,000	.026033	.001700	....	....	
15,500	62,000	.029900	.003867	....	....	
16,000	64,000	.033833	.003933	....	....	
16,500	66,000	.038500	.004667	....	....	
17,000	68,000	.044833	.006333	....	....	
17,500	70,000	.051533	.006700	....	....	
18,000	72,000	.060400	.008867	....	....	
18,500	74,000	.071933	.011533	....	....	
19,000	76,000	.1033	.031367	....	....	
19,500	78,000	.1400	.0367	....	....	Tensile strength.
18,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8584
Hardness		12.45
Tensile strength per square inch of original section	pounds..	78,000
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.000900
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		30.4
Position of rupture		″.25 from neck
Character of broken surface		silky
Elongation of inch sections		″.31* ″.18, ″.14

No. 766.

Marks, $^{8\,\mathrm{T}_{14}}_{\mathrm{B\,T_{2}O}}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000367	.000134	0.	....	
5, 000	20, 000	.000533	.000166	0.	....	
6, 250	25, 000	.000700	.000167	0.	....	
7, 500	30, 000	.000867	.000167	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001133	.000066	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001200	.000033	....	....	
10, 000	40, 000	.001233	.000033	0.	....	
10, 250	41, 000	.001267	.000034	....	....	Elastic limit.
10, 500	42, 000	.003233	.001966	....	....	
10, 750	43, 000	.004133	.000900	....	....	
11, 000	44, 000	.005000	.000867	....	....	
11, 250	45, 000	.005867	.000867	.004233	.004233	
11, 500	46, 000	.007433	.001566	....	....	
11, 750	47, 000	.007733	.000300	....	....	
12, 000	48, 000	.008533	.000800	....	....	
12, 250	49, 000	.009433	.000900	....	....	
12, 500	50, 000	.010667	.001234	.008800	.004567	
12, 750	51, 000	.011600	.000933	....	....	
13, 000	52, 000	.012500	.000900	....	....	
13, 250	53, 000	.013667	.001167	....	....	
13, 560	54, 000	.015200	.001533	....	....	
13, 750	55, 000	.016233	.001033	....	....	
14, 000	56, 000	.017333	.001100	....	....	
14, 250	57, 000	.018400	.001067	....	....	
14, 500	58, 000	.019833	.001433	....	....	
14, 750	59, 000	.021133	.001300	....	....	
15, 000	60, 000	.022533	.001400	....	....	
15, 500	62, 000	.026167	.003634	....	....	
16, 000	64, 000	.029333	.003166	....	....	
16, 500	66, 000	.033333	.004000	....	....	
17, 000	68, 000	.037333	.004000	....	....	
17, 500	70, 000	.041700	.004367	....	....	
18, 000	72, 000	.047667	.005967	....	....	
18, 500	74, 000	.054733	.007066	....	....	
19, 000	76, 000	.063600	.008867	....	....	
19, 500	78, 000	.077333	.013733	....	....	
20, 000	80, 000	.1133	.035967	....	....	
20, 200	80, 800	.1867	.0734	....	....	Tensile strength.
17, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	80, 800
Elastic limit per square inch of original section	do	41, 000
Elongation per inch after rupture	inch	0. 2367
Elongation per inch under strain at elastic limit	do	.001267
Reduction in diameter at point of rupture	do	.143
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		at middle of stem
Character of broken surface		granular, 60 per centum; silky, 40 per centum
Elongation of inch sections		″.14, ″.42, ″.15

No. 767.

Marks, $\mathrm{B}\,\overset{8\ \mathrm{T}_{14}}{\mathrm{T}_{3}\ \mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000400	.000200	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001233	.000066	0.	....	
10,250	41,000	.001300	.000067	....	....	Elastic limit.
10,500	42,000	.002867	.001567	....	....	
10,750	43,000	.004167	.001300	....	....	
11,000	44,000	.005433	.001266	....	....	
11,250	45,000	.006233	.000800	.004533	.004533	
11,500	46,000	.007267	.001034	....	....	
11,750	47,000	.008100	.000833	....	....	
12,000	48,000	.009400	.001300	....	....	
12,250	49,000	.010300	.000900	....	....	
12,500	50,000	.011533	.001233	.009633	.005100	
12,750	51,000	.012467	.000934	....	....	
13,000	52,000	.013200	.000733	....	....	
13,250	53,000	.014067	.000867	....	....	
13,500	54,000	.015667	.001600	....	....	
13,750	55,000	.016833	.001166	....	....	
14,000	56,000	.018333	.001500	....	....	
14,250	57,000	.019667	.001334	....	....	
14,500	58,000	.020733	.001066	....	....	
14,750	59,000	.022000	.001267	....	....	
15,000	60,000	.023933	.001933	....	....	
15,500	62,000	.027167	.003234	....	....	
16,000	64,000	.030733	.003566	....	....	
16,500	66,000	.034767	.004034	....	....	
17,000	68,000	.039333	.004566	....	....	
17,500	70,000	.045000	.005667	....	....	
18,000	72,000	.051333	.006333	....	....	
18,500	74,000	.059333	.008000	....	....	
19,000	76,000	.070000	.010667	....	....	
19,500	78,000	.0933	.0233	....	....	
20,000	80,000	.1300	.0367	....	....	
20,080	80,320	.1700	.0400	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	80,320
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	.02300
Elongation per inch under strain at elastic limit	do...	.00300
Reduction in diameter at point of rupture	do...	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.25 from middle of stem
Character of broken surface		silky, cracks developed in cylindrical surface of stem
Elongation of inch sections		″.16, ″.34*, ″.19

No. 768.

Marks, $\overset{8}{\text{M}}\ \overset{\text{T}_{14}}{\text{T}_{1}}\ \text{I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.	....	
2, 500	10, 000	. 000267	. 000134	0.	....	
3, 750	15, 000	. 000400	. 000133	0.	....	
5, 000	20, 000	. 000567	. 000167	0.	....	
6, 250	25, 000	. 000733	. 000166	0.	....	
7, 500	30, 000	. 000900	. 000167	0.	....	
8, 750	35, 000	. 001067	. 000167	0,	....	
9, 000	36, 000	. 001100	. 000033	....	....	
9, 250	37, 000	. 001133	. 000033	....	....	
9, 500	38, 000	. 001133	0.	....	....	
9, 750	39, 000	. 001167	. 000034	....	....	
10, 000	40, 000	. 001200	. 000033	0.	....	
10, 250	41, 000	. 001233	. 000033	....	....	
10, 500	42, 000	. 001267	. 000034	....	....	
10, 750	43, 000	. 001300	. 000033	....	....	
11, 000	44, 000	. 001367	. 000067	....	....	
11, 250	45, 000	. 001400	. 000033	. 000067	. 000067	Elastic limit.
11, 500	46, 000	. 001833	. 000433	....	....	
11, 750	47, 000	. 002933	. 001100	....	....	
12, 000	48, 000	. 005667	. 002734	....	....	
12, 250	49, 000	. 006867	. 001200	....	....	
12, 500	50, 000	. 007600	. 000733	. 005767	. 005700	
12, 750	51. 000	. 008400	. 000800	....	....	
13, 000	52, 000	. 009067	. 000667	....	....	
13, 250	53, 000	. 010000	. 000933	....	....	
13, 500	54, 000	. 011400	. 001400	....	....	
13, 750	55, 000	. 012367	. 000967	....	....	
14, 000	56, 000	. 013500	. 001133	....	....	
14, 250	57, 000	. 014567	. 001067	....	....	
14, 500	58, 000	. 015933	. 001366	....	....	
14, 750	50, 000	. 017000	. 001067	....	....	
15, 000	60, 000	. 018433	. 001433	....	....	
15, 500	62, 000	. 021033	. 002600	....	....	
16, 000	64, 000	. 024067	. 003034	....	....	
16, 500	66, 000	. 027667	. 003600	....	....	
17, 000	68, 000	. 030700	. 003033	....	....	
17, 500	70, 000	. 034667	. 003967	....	....	
18, 000	72, 000	. 039167	. 004500	....	....	
18, 500	74, 600	. 044333	. 005166	....	....	
19, 000	76 000	. 051167	. 006834	....	....	
19, 500	78, 000	. 059000	. 007833	....	....	
20, 000	80, 000	. 070667	. 011667	....	....	
20, 500	82, 000	. 0967	. 026033	....	....	
20, 960	33, 840	. 1433	. 0466	....	....	Tensile strength.
19, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8564
Hardness		13. 85
Tesile strength per square inch of original section	pounds..	83, 840
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 1867
Elongation per inch under strain at elastic limit	do....	. 001400
Reduction in diameter at point of rupture	do....	. 093
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		″.1 from middle of stem
Character of broken surface		granular, radiating from a small dull spot at the circumference
Elongation of inch sections		″.12, ″.2[illegible], ″.15

No. 769.

Marks, $\overset{8}{M}\ \overset{T_{14}}{T_3}\ O$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001000	.000100	.000033	.000033	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001167	.000034	.000033	0.	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	.000033	0.	
11,500	46,000	.001367	.000034	....	....	Elastic limit.
11,750	47,000	.003167	.001800	....	....	
12,000	48,000	.006200	.003033	....	....	
12,250	49,000	.006500	.000300	....	....	
12,500	50,000	.007267	.000767	.005500	.005467	
12,750	51,000	.007767	.000500	....	....	
13,000	52,000	.008467	.000700	....	....	
13,250	53,000	.009800	.001333	....	....	
13,500	54,000	.010700	.000900	....	....	
13,750	55,000	.011767	.001067	....	....	
14,000	56,000	.012867	.001100	....	....	
14,250	57,000	.013833	.000966	....	....	
14,500	58,000	.015067	.001234	....	....	
14,750	59,000	.016100	.001033	....	....	
15,000	60,000	.017433	.001333	....	....	
15,500	62,000	.020333	.002900	....	....	
16,000	64,000	.022400	.002067	....	....	
16,500	66,000	.025067	.002667	....	....	
17,000	68,000	.028433	.003366	....	....	
17,500	70,000	.031667	.003234	....	....	
18,000	72,000	.035833	.004166	....	....	
18,500	74,000	.040600	.004767	....	....	
19,000	76,000	.045000	.004400	....	....	
19,500	78,000	.051333	.006333	....	....	
20,000	80,000	.061167	.009834	....	....	
20,500	82,000	.070667	.009500	....	....	
21,000	84,000	.1033	.032633	....	....	
21,460	85,840	.1400	.0367	....	....	Tensile strength.
18,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85,840
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.2567
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.1 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.21, ″.41*, ″.15

No. 770.

Marks, $\overset{8\,T_{14}}{M\,T_{3}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000267	.000200	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000867	.000134	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
0, 250	37, 000	.001067	0.	....	....	
9, 500	38, 000	.001100	.000033	....	....	
9, 750	39, 000	.001133	.000033	....	....	
10, 000	40, 000	.001167	.000034	0.	....	
10, 250	41, 000	.001200	.000033	....	....	
10, 500	42, 000	.001233	.000033	....	....	
10, 750	43, 000	.001267	.000034	....	....	
11, 000	44, 000	.001300	.000033	....	....	
11. 250	45, 000	.001333	.000033	.000033	.000033	Elastic limit.
11, 500	46, 000	.001600	.000267	....	....	
11, 750	47, 000	.002000	.000400	....	....	
12, 000	48, 000	.003267	.001267	....	....	
12, 250	49, 000	.004733	.001466	....	....	
12, 500	50, 000	.006367	.001634	.004567	.004534	
12, 750	51, 000	.007267	.000900	....	....	
13, 000	52, 000	.007700	.000433	....	....	
13, 250	53, 000	.008267	.000567	....	....	
13, 500	54, 000	.009400	.001133	....	....	
13, 750	55, 000	.010333	.000933	....	....	
14, 000	56, 000	.011400	.001067	....	....	
14, 250	57, 000	.012333	.000933	....	....	
14, 500	58, 000	.013333	.001000	....	....	
14, 750	59, 000	.014067	.000734	....	....	
15, 000	60, 000	.015500	.001433	....	....	
15, 500	62, 000	.017700	.002200	....	....	
16, 000	64, 000	.020167	.002467	....	....	
16, 500	66, 000	.022667	.002500	....	....	
17, 000	68, 000	.025333	.002666	....	....	
17. 500	70, 000	.028233	.002900	....	....	
18, 000	72, 000	.031700	.003467	....	....	
18, 500	74, 000	.035500	.003800	....	....	
19, 000	76, 000	.039333	.003833	....	....	
19, 500	78, 000	.044667	.005334	....	....	
20, 000	80, 000	.050833	.006166	....	....	
20. 500	82, 000	.058333	.007500	....	....	
21, 000	84, 000	.068667	.010334	....	....	
21, 500	86, 000	.0900	.021333	....	....	
21, 770	87, 080	.1133	.0233	....	....	Tensile strength.
19, 500	....	....	....	....	....	Load at time of rupture.

General summary.

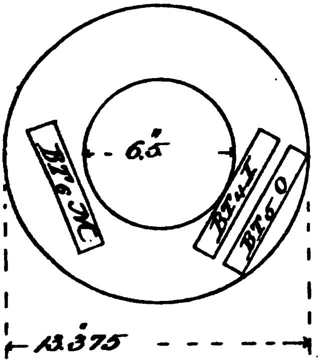
Tensile strength per square inch of original section	pounds..	87, 080
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 1767
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diamater at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.35′, ″.10, ″.08

8" Converted Rifle

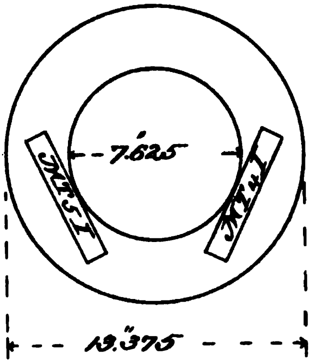
Tube No. 14

Additional specimens

Breech



Muzzle



S Ex 36 49 1

No. 847.

Marks, $\overset{8\ T_{14}}{B\ T_{4}\ I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001367	.000067	....	....	Elastic limit.
11,000	44,000	.007333	.005966	....	....	
11,250	45,000	.008400	.001067	.006833	.006833	
11,500	46,000	.009167	.000767	....	....	
11,750	47,000	.010000	.000833	....	....	
12,000	48,000	.011500	.001500	....	....	
12,250	49,000	.013133	.001633	....	....	
12,500	50,000	.014167	.001034	.012333	.005500	
12,750	51,000	.014933	.000766	....	....	
13,000	52,000	.016667	.001734	....	....	
13,250	53,000	.018267	.001600	....	....	
13,500	54,000	.020000	.001733	....	....	
13,750	55,000	.021400	.001400	....	....	
14,000	56,000	.023100	.001700	....	....	
14,250	57,000	.025000	.001900	....	....	
14,500	58,000	.028000	.003000	....	....	
14,750	59,000	.030000	.002000	....	....	
15,000	60,000	.032333	.002333	....	....	
15,500	62,000	.037167	.004834	....	....	
16,000	64,000	.042833	.005666	....	....	
16,500	66,000	.049833	.007000	....	....	
17,000	68,000	.058833	.009000	....	....	
17,500	70,000	.0667	.007867	....	....	
18,000	72,000	.0900	.0233	....	....	
18,460	73,840	.1567	.0667	....	....	Tensile strength.
16,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	73,840
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.143
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		″.16, ″.40*, ″.16

No. 848.

Marks, $\overset{8\ T_{14}}{B\ T_5\ O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000733	.000100	.000033	.000033	
7,500	30,000	.000900	.000167	.000033	0.	
8,750	35,000	.001033	.000133	.000067	.000034	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001167	.000067	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001267	.000067	.000133	.000066	Elastic limit.
10,250	41,000	.004467	.003200	....	....	
10,500	42,000	.006733	.002266	....	....	
10,750	43,000	.007433	.000700	....	....	
11,000	44,000	.008300	.000867	....	....	
11,250	45,000	.009267	.000967	.007600	.007467	
11,500	46,000	.010567	.001300	....	....	
11,750	47,000	.011467	.000900	....	....	
12,000	48,000	.013100	.001633	....	....	
12,250	49,000	.013933	.000833	....	....	
12,500	50,000	.015867	.001934	.013967	.006367	
12,750	51,000	.016300	.000433	....	....	
13,000	52,000	.017433	.001133	....	....	
13,250	53,000	.008733	.001300	....	....	
13,500	54,000	.020333	.001600	....	....	
13,750	55,000	.021933	.001600	....	....	
14,000	56,000	.023933	.002000	....	....	
14,250	57,000	.024333	.000400	....	....	
14,500	58,000	.027333	.003000	....	....	
14,750	59,000	.029500	.002167	....	....	
15,000	60,000	.031500	.002000	....	....	
15,500	62,000	.036167	.004667	....	....	
16,000	64,000	.041000	.004833	....	....	
16,500	66,000	.047333	.006333	....	....	
17,000	68,000	.055167	.007834	....	....	
17,500	70,000	.0667	.011533	....	....	
18,000	72,000	.0833	.0166	....	....	
18,500	74,000	.1100	.0267	....	....	
18,990	75,960	.1700	.0600	....	....	Tensile strength.
16,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	75,960
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2667
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".5 from middle stem
Character of broken surface		silky; cup-shaped end
Elongation of inch sections		".27, ".36*, ".17

No. 849.

Marks, $\frac{8\ T_{14}}{B\ T_{8}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000533	.000133	0.	....	
6, 250	25, 000	.000700	.000167	0.	....	
7, 500	30, 000	.000867	.000167	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001100	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001167	.000034	....	....	
10, 000	40, 000	.001200	.000033	.000033	.000033	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001300	.000067	....	....	Elastic limit.
10, 750	43, 000	.002800	.001500	....	....	
11, 000	44, 000	.005500	.002700	....	....	
11, 250	45, 000	.006933	.001433	.005400	.005367	
11, 500	46, 000	.008433	.001500	....	....	
11, 750	47, 000	.009000	.000567	....	....	
12, 000	48, 000	.009833	.000833	....	....	
12, 250	49, 000	.011000	.001167	....	....	
12, 500	50, 000	.012400	.001400	.010600	.005200	
12, 750	51, 000	.013733	.001333	....	....	
13, 000	52, 000	.014733	.001000	....	....	
13, 250	53, 000	.015733	.001000	....	....	
13, 500	54, 000	.017600	.001867	....	....	
13, 750	55, 000	.018933	.001333	....	....	
14, 000	56, 000	.021067	.002134	....	....	
14, 250	57, 000	.022333	.001266	....	....	
14, 500	58, 000	.023667	.001334	....	....	
14, 750	59, 000	.025267	.001600	....	....	
15, 000	60, 000	.027400	.002133	....	....	
15, 500	62, 000	.031667	.004267	....	....	
16, 000	64, 000	.036333	.004666	....	....	
16, 500	66, 000	.041333	.005000	....	....	
17, 000	68, 000	.048333	.007000	....	....	
17, 500	70, 000	.056667	.008334	....	....	
18, 000	72, 000	.0667	.010033	....	....	
18, 500	74, 000	.0900	.0233	....	....	
19, 000	76, 000	.1300	.0400	....	....	
19, 060	76, 240	.1667	.0367	....	....	Tensile strength.
17, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section............pounds.. 76, 240
Elastic limit per square inch of original section............do.... 42, 000
Elongation per inch after rupture............inch.. 0. 2800
Elongation per inch under strain at elastic limit............do.... .001300
Reduction in diameter at point of rupture............do.... .104
Reduction in area after rupture, per centum of original section............ 33. 5
Position of rupture............″.4 from middle of stem
Character of broken surface............granular, radiating from dull spot at circumference
Elongation of inch sections............″. 18, ″. 85*, ″. 16

No. 850.

Marks, $\substack{8\ T_{14}\\ M\ T_{4}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000067	.000067	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000067	0.	Elastic limit.
11,500	46,000	.001667	.000267	....	....	
11,750	47,000	.002233	.000666	....	....	
12,000	48,000	.003733	.001500	....	....	
12,250	49,000	.005500	.001767	....	....	
12,500	50,000	.008500	.003000	.006667	.006600	
12,750	51,000	.009000	.000500	....	....	
13,000	52,000	.009933	.000933	....	....	
13,250	53,000	.011367	.001434	....	....	
13,500	54,000	.012667	.001300	....	....	
13,750	55,000	.013733	.001066	....	....	
14,000	56,000	.015100	.001367	....	....	
14,250	57,000	.016367	.001267	....	....	
14,500	58,000	.018000	.001633	....	....	
14,750	59,000	.019167	.001167	....	....	
15,000	60,000	020867	.001700	....	....	
15,500	62,000	.024000	.003133	....	....	
16,000	64,000	.027667	.003667	....	....	
16,500	66,000	.032233	.004566	....	....	
17,000	68,000	.036333	.004100	....	....	
17,500	70,000	.041533	.005200	....	....	
18,000	72,000	.049000	.007467	....	....	
18,500	74,000	.057167	.008167	....	....	
19,000	76,000	.070667	.013500	....	....	
19,500	78,000	.0900	.019333	....	....	
19,940	79,760	.1500	.0600	....	....	Tensile strength.
17,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,760
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.75 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.33, ″.13, ″.13

No. 851.

Marks, $^{8}_{M}\mathrm{T}^{4}_{\mathrm{T}_5}\mathrm{I}$
Diameter, ***″.563.***
Sectional area, **.25** square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000467	.000134	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000733	.000100	0.	....	
7 500	30, 000	.000967	.000234	0.	....	
8, 750	35, 000	.001033	.000066	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001100	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001133	0.	....	....	
10, 000	40, 000	.001167	.000034	.000033	.000033	
10, 250	41, 000	.001267	.000100	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001333	0.	....	....	
11, 250	45, 000	.001367	.000034	.000033	0.	
11, 500	46, 000	.001400	.000033	....	....	
11, 750	47, 000	.001433	.000033	....	....	
12, 000	48, 000	.001467	.000034	....	....	
12, 250	49, 000	.001500	.000033	....	....	Elastic limit.
12, 500	50, 000	.002067	.000567	.000633	.000600	
12, 750	51, 000	.002533	.000466	....	....	
13, 000	52, 000	.004300	.001767	....	....	
13, 250	53, 000	.005933	.001633	....	....	
13, 500	54, 000	.008333	.002400	....	....	
13, 750	55, 000	.009667	.001334	....	....	
14, 000	56, 000	.011333	.001666	....	....	
14, 250	57, 000	.012000	.000667	....	....	
14, 500	58, 000	.012833	.000833	....	....	
14, 750	59, 000	.013667	.000834	....	....	
15, 000	60, 000	.015333	.001666	....	....	
15, 500	62, 000	.018067	.002734	....	....	
16, 000	64, 000	.021333	.003266	....	....	
16, 500	66, 000	.024167	.002834	....	....	
17, 000	68, 000	.027600	.003433	....	....	
17, 500	70, 000	.031667	.004067	....	....	
18, 000	72, 000	.036333	.004666	....	....	
18, 500	74, 000	.041233	.004900	....	....	
19, 000	76, 000	.047400	.006167	....	....	
19, 500	78, 000	.055500	.008100	....	....	
20, 000	80, 000	.0633	.0078	....	....	
20, 500	82, 000	.0933	.0300	....	....	
20, 750	83, 000	.1200	.0267	....	....	Tensile strength.
17, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	83, 000
Elastic limit per square inch of original section	do....	49, 000
Elongation per inch after rupture	inch..	0. 1900
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.163
Reduction in area after rupture, per centum of original section		46. 7
Position of rupture		″. 5 from neck
Character of broken surface		silky
Elongation of inch sections		″.37*, ″.11, ″.09

TUBE No. 15.—8″ *Converted Rifle*

No. 781.

Marks, $\substack{8\ T_{15} \\ B\ T_{1}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000200	.000200	.000033	.000033	
2,500	10,000	.000367	.000167	.000033	0.	
3,750	15,000	.000533	.000166	.000067	.000034	
5,000	20,000	.000667	.000134	.000067	0.	
6,250	25,000	.000800	.000133	.000067	0.	
7,500	30,000	.000967	.000167	.000067	0.	
8,750	35,000	.001133	.000166	.000067	0.	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	.000133	.000066	Elastic limit.
10,250	41,000	.001600	.000233	....	....	
10 500	42,000	.002300	.000700	....	....	
10,750	43.000	.003500	.001200	....	....	
11,000	44.000	.005600	.002100	....	....	
11,250	45,000	.006600	.001000	.004933	.004800	
11,500	46,000	.007700	.001100	....	....	
11,750	47,000	.008600	.000900	....	....	
12,000	48,000	.009933	.001333	....	....	
12,250	49,000	.011267	.001334	....	....	
12,500	50,000	.012333	.001066	.010600	....	
12,750	51,000	.013267	.000934	....	....	
13,000	52,000	.014600	.001333	....	....	
13,250	53,000	.014967	.000367	....	....	
13,500	54,000	.017267	.002300	....	....	
13,750	55,000	.019267	.002000	....	....	
14,000	56,000	.020167	.000900	....	....	
14,250	57,000	.021333	.001166	....	....	
14,500	58,000	.023333	.002000	....	....	
14,750	59,000	.025567	.002234	....	....	
15,000	60,000	.026867	.001300	....	....	
15,500	62,000	.030667	.003800	....	....	Crack in sight in cylindrical surface.
16,000	64,000	.036333	.005666	....	....	
16,500	66,000	.041000	.004667	....	....	
17,000	68.000	.047700	.006700	....	....	
17,500	70,000	.055333	.007633	....	....	
18,000	72,000	.0700	.014667	....	....	Tensile strength.

General summary.

Specific gravity		7.8581
Hardness		12.30
Tensile strength per square inch of original section	pounds..	72,000
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.1000
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″ from neck
Character of broken surface		dull porous; light green lines on broken surface
Elongation of inch sections		″.06, ″.09, ″.15*

No. 849.

Marks, $^{8\,T_{14}}_{B\,T_8\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5. 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000533	.000133	0.	....	
6, 250	25, 000	.000700	.000167	0.	....	
7, 500	30, 000	.000867	.000167	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001100.	.000033	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001167	.000034	....	....	
10, 000	40, 000	.001200	.000033	.000033	.000033	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001300	.000067	....	....	Elastic limit.
10, 750	43, 000	.002800	.001500	....	....	
11, 000	44, 000	.005500	.002700	....	....	
11, 250	45, 000	.006933	.001433	.005400	.005367	
11, 500	46, 000	.008433	.001500	....	....	
11, 750	47, 000	.009000	.000567	....	....	
12, 000	48, 000	.009833	.000833	....	....	
12, 250	49, 000	.011000	.001167	....	....	
12, 500	50, 000	.012400	.001400	.010600	.005200	
12, 750	51, 000	.013733	.001333	....	....	
13, 000	52, 000	.014733	.001000	....	....	
13, 250	53, 000	.015733	.001000	....	....	
13, 500	54, 000	.017600	.001867	....	....	
13, 750	55, 000	.018933	.001333	....	....	
14, 000	56, 000	.021067	.002134	....	....	
14, 250	57, 000	.022333	.001266	....	....	
14, 500	58, 000	.023667	.001334	....	....	
14, 750	59, 000	.025267	.001600	....	....	
15, 000	60, 000	.027400	.002133	....	....	
15, 500	62, 000	.031667	.004267	....	....	
16, 000	64, 000	.036333	.004666	....	....	
16, 500	66, 000	.041333	.005000	....	....	
17, 000	68, 000	.048333	.007000	....	....	
17, 500	70, 000	.056667	.008334	....	....	
18, 000	72, 000	.0667	.010033	....	....	
18, 500	74, 000	.0900	.0233	....	....	
19, 000	76, 000	.1300	.0400	....	....	
19, 060	76, 240	.1667	.0367	....	....	Tensile strength.
17, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	76, 240
Elastic limit per square inch of original section	do....	42, 000
Elongation per inch after rupture	inch..	0. 2300
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		″.4 from middle of stem
Character of broken surface		granular, radiating from dull spot at circumference
Elongation of inch sections		″.18, ″.35*, ″.16

No. 783.

Marks, $\overset{8\,T_{14}}{B\,T_{3}\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	.000067	.000067	
5,000	20,000	.000600	.000167	.000100	.000033	
6,250	25,000	.000767	.000167	.000100	0.	
7,500	30,000	.000933	.000166	.000100	0.	
8,750	35,000	.001133	.000200	.000133	.000033	
9,000	36,000	.001200	.000067			
9,250	37,000	.001300	.000100			Elastic limit.
9,500	38,000	.001800	.000500			
9,750	39,000	.002367	.000567			
10,000	40,000	.003833	.001466	.002567	.002434	
10,250	41,000	.004967	.001134			
10,500	42,000	.006067	.001100			
10,750	43,000	.006800	.000733			
11,000	44,000	.008367	.001567			
11,250	45,000	.009100	.000733	.007500	.004933	
11,500	46,000	.010333	.001233			
11,750	47,000	.011067	.000734			
12,000	48,000	.012500	.001433			
12,250	49,000	.013433	.000933			
12,500	50,000	.014867	.001434	.012933		
12,750	51,000	.015833	.000966			
13,000	52,000	.016933	.001100			
13,250	53,000	.018200	.001267			
13,500	54,000	.020033	.001833			
13,750	55,000	.021500	.001467			
14,000	56,000	.023067	.001567			
14,250	57,000	.024667	.001600			
14,500	58,000	.026367	.001700			
14,750	59,000	.028100	.001733			
15,000	60,000	.030333	.002233			
15,500	62,000	.034700	.004367			
16,000	64,000	.039000	.004300			
16,500	66,000	.045333	.006333			
17,000	68,000	.052933	.007600			Cracks in sight.
17,500	70,000	.0600	.007067			
18,000	72,000	.0733	.0133			
18,400	73,000	.0067	.0234			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	73,600
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.1107
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.45 from middle of stem
Character of broken surface		granular, 40 per centum; dull porous, 60 per centum; cracks developed in vicinity of the fracture.
Elongation of inch sections		″.07, ″.17*, ″.11

No. 784.

Marks, $\overset{8\ T_{15}}{M\ T_1\ I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000233	.000166	0.	....	
3, 750	15, 000	.000367	.000134	0.	....	
5, 000	20, 000	.000533	.000166	0.	....	
6, 250	25, 000	.000700	.000167	0.	....	
7, 500	30, 000	.000867	.000167	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
9, 000	36, 000	.001067	.000034	....	....	
9, 250	37, 000	.001067	0.	....	....	
9, 500	38, 000	.001100	.000033	....	....	
9, 750	39, 000	.001133	.000033	....	....	
10, 000	40, 000	.001167	.000034	—.000033	—.000033	
10, 250	41, 000	.001233	.000066	....	....	
10, 500	42, 000	.001267	.000034	....	....	
10, 750	43, 000	.001300	.000033	....	....	
11, 000	44, 000	.001333	.000033	....	....	
11, 250	45, 000	.001367	.000034	.000000	.000033	
11, 500	46, 000	.001407	.000100	....	....	Elastic limit.
11, 750	47, 000	.002033	.000566	....	....	
12, 000	48, 000	.003367	.001334	....	....	
12, 250	49, 000	.004933	.001566	....	....	
12, 500	50, 000	.006600	.001667	.004800	.004800	
12, 750	51, 000	.007133	.000533	....	....	
13, 000	52, 000	.008133	.001000	....	....	
13, 250	53, 000	.009000	.000867	....	....	
13, 500	54, 000	.010400	.001400	....	....	
13, 750	55, 000	.011533	.001133	....	....	
14, 000	56, 000	.012933	.001400	....	....	
14, 250	57, 000	.014000	.001067	....	....	
14, 500	58, 000	.015200	.001200	....	....	
14, 750	59, 000	.016300	.001100	....	....	
15, 000	60, 000	.017667	.001367	....	....	
15, 500	62, 000	.020600	.002933	....	....	
16, 000	64, 000	.023667	.003067	....	....	
16, 500	66, 000	.027433	.003766	....	....	
17, 000	68, 000	.030833	.003400	....	....	
17, 500	70, 000	.035000	.004167	....	....	
18, 000	72, 000	.040000	.005000	....	....	
18, 500	74, 000	.046167	.006167	....	....	
19, 000	76, 000	.053600	.007433	....	....	
19, 500	78, 000	.063000	.0094	....	....	
20, 000	80, 000	.080000	.0170	....	....	
20, 330	81, 320	.1300	.0500	....	....	Tensile strength.
17, [illegible]	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8562
Hardness		12. 25
Tensile strength per square inch of original section	pounds..	81, 320
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 1900
Elongation per inch under strain at elastic limit	do....	.001407
Reduction in diameter at point of rupture	do....	.163
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		1″.3 from neck
Character of broken surface		silky
Elongation of inch sections		″.24*, ″.25*, ″.08

No. 785.

Marks, $\overset{8}{\text{M}}\,\overset{\text{T}_5}{\text{T}_2}\,\text{O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000033	.000033	0.		
2, 500	10, 000	.000200	.000167	0.		
3, 750	15, 000	.000367	.000167	0.		
5, 000	20, 000	.000533	.000166	0.		
6, 250	25, 000	.000700	.000167	0.		
7, 500	30, 000	.000867	.000167	0.		
8, 750	35, 000	.001033	.000166	0.		
9, 000	36, 000	.001067	.000034			
9, 250	37, 000	.001100	.000033			
9, 500	38, 000	.001133	.000033			
9, 750	39, 000	.001167	.000034			
10, 000	40, 000	.001233	.000066	0.		
10, 250	41, 000	.001300	.000067			
10, 500	42, 000	.001367	.000067			
10, 750	43, 000	.001400	.000033			Elastic limit.
11, 000	44, 000	.001800	.000400			
11, 250	45, 000	.003367	.000567	.001800	.001800	
11, 500	46, 000	.004967	.001600			
11, 750	47, 000	.005500	.000533			
12, 000	48, 000	.006900	.001400			
12, 250	49, 000	.007833	.000933			
12, 500	50, 000	.008667	.000834	.006767	.004967	
12, 750	51, 000	.009500	.000833			
13, 000	52, 000	.010600	.001100			
13, 250	53, 000	.011500	.000900			
13, 500	54, 000	.013033	.001533			
13, 750	55, 000	.013933	.000900			
14, 000	56, 000	.015333	.001400			
14, 250	57, 000	.016500	.001167			
14, 500	58, 000	.017700	.001200			
14, 750	59, 000	.018933	.001233			
15, 000	60, 000	.020400	.001467			
15, 500	62, 000	.023433	.003033			
16, 000	64, 000	.026667	.003234			
16, 500	66, 000	.030400	.003733			
17, 000	68, 000	.034267	.003867			
17, 500	70, 000	.039500	.005233			
18, 000	72, 000	.045000	.005500			
18, 500	74, 000	.051667	.006667			
19, 000	76, 000	.060000	.008333			
19, 500	78, 000	.0733	.0133			
20, 000	80, 000	.0967	.0234			
20, 810	81, 240	.1400	.0433			Tensile strength.
16, 900						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81, 240
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 2633
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		1″. 3 from neck
Character of broken surface		silky
Elongation of inch sections		″.29, ″.36*, ″.14

No. 786.

Marks, $\overset{8\ T_{14}}{M\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	.000033	.000033	
2, 500	10, 000	.000333	.000166	.000067	.000034	
3, 750	15, 000	.000500	.000167*	.000067	0.	
5, 000	20, 000	.000667	.000167	.000067	0.	
6, 250	25, 000	.000833	.000166	.000067	0.	
7, 500	30, 000	.001000	.000167	.000067	0.	
8, 750	35, 000	.001167	.000167	.000067	0.	
9, 000	36, 000	.001200	.000033			
9, 250	37, 000	.001233	.000033			
9, 500	38, 000	.001267	.000034			
9, 750	39, 000	.001300	.000033			
10, 000	40, 000	.001333	.000033	.000183	.000066	Elastic limit.
10, 250	41, 000	.002100	.000767			
10, 500	42, 000	.002967	.000867			
10, 750	43, 000	.003333	.000366			
11, 000	44, 000	.005333	.002000			
11, 250	45, 000	.007067	.001734	.005433	.005300	
11, 500	46, 000	.008667	.001600			
11, 750	47, 000	.009500	.000833			
12, 000	48, 000	.010167	.000667			
12, 250	49, 000	.011000	.000833			
12, 500	50, 000	.012267	.001267	.010400	.004967	
12, 750	51, 000	.012900	.000633			
13, 000	52, 000	.014633	.001733			
13, 250	53, 000	.015433	.000800			
13, 500	54, 000	.016800	.001367			
13, 750	55, 000	.018000	.001200			
14, 000	56, 000	.019700	.001700			
14, 250	57, 000	.021500	.001800			
14, 500	58, 000	.022333	.000833			
14, 750	59, 000	.024000	.001667			
15, 000	60, 000	.025700	.001700			
15, 500	62, 000	.029333	.003633			
16, 600	64, 000	.032900	.003567			
16, 500	66, 000	.037367	.004467			
17, 000	68, 000	.043000	.005633			
17, 500	70, 000	.049500	.006500			
18, 000	72, 000	.057333	.007833			
18, 500	74, 000	.065000	.007667			
19, 000	76, 000	.0900	.0250			
19, 500	78, 000	.1267	.0367			
10, 540	78, 160	.1433	.0166			Tensile strength.
16, 300						Load at time of rupture.

General summary.

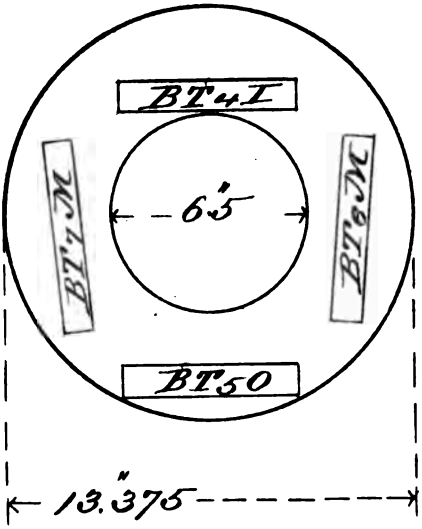
Tensile strength per square inch of original section	pounds..	78, 160
Elastic limit per square inch of original section	do....	40, 000
Elongation per inch after rupture	inch..	0. 2333
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54. 6
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.46*, ″.18, ″.11

8" Converted Rifle

Tube No. 15

Additional specimens

Breech



S Ex 36 49 1

No. 882.

Marks, $\overset{8\ T_{16}}{B\ T_{4}\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	Elastic limit.
10,750	43,000	.002267	.000900	....	....	
11,000	44,000	.003267	.001000	....	....	
11,250	45,000	.006133	.002866	.004433	.004433	
11,500	46,000	.006667	.000534	....	....	
11,750	47,000	.007233	.000566	....	....	
12,000	48,000	.009000	.001767	....	....	
12,250	49,000	.010400	.001400	....	....	
12,500	50,000	.011433	.001033	.009567	.005134	
12,750	51,000	.012133	.000700	....	....	
13,000	53,000	.013333	.001200	....	....	
13,250	53,000	.014367	.001034	....	....	
13,500	54,000	.016033	.001666	....	....	
13,750	55,000	.017533	.001500	....	....	
14,000	56,000	.019000	.001467	....	....	
14,250	57,000	.020000	.001000	....	....	
14,500	58,000	.021800	.001800	....	....	
14,750	59,000	.023167	.001367	....	....	
15,000	60,000	.025000	.001833	....	....	
15,500	62,000	.028667	.003667	....	....	
16,000	64,000	.032833	.004166	....	....	
16,500	66,000	.037500	.004667	....	....	
17,000	68,000	.042667	.005167	....	....	
17,500	70,000	.049500	.006833	....	....	
18,000	72,000	.057833	.008333	....	....	
18,500	74,000	.067000	.009167	....	....	
19,000	76,000	.0900	.0230	....	....	
19,500	78,000	.1400	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..........pounds..	78,000
Elastic limit per square inch of original section..........do....	42,000
Elongation per inch after rupture..........inch..	0.2333
Elongation per inch under strain at elastic limit..........do....	.001367
Reduction in diameter at point of rupture..........do....	.164
Reduction in area after rupture, per centum of original section..........	49.7
Position of rupture..........	".75 from neck
Character of broken surface..........	silky, lamellar
Elongation of inch sections..........	".41*, ".16, ".13

No. 883.

Marks, $\mathrm{B}\,\overset{8\,\mathrm{T}_{16}}{\mathrm{T}_{1}}\,\mathrm{O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000367	.000200	.000033	0.	
3,750	15,000	.000567	.000200	.000067	.000034	
5,000	20,000	.000733	.000166	.000067	0.	
6,250	25,000	.000867	.000134	.000100	.000033	
7,500	30,000	.001033	.000166	.000100	0.	
8,750	35,000	.001233	.000200	.000167	.000067	
9,000	36,000	.001267	.000034	....	....	
9,250	37,000	.001300	.000033	....	....	Elastic limit.
9,500	38,000	.001433	.000133	....	....	
9,750	39,000	.002000	.000567	....	....	
10,000	40,000	.003000	.001000	.001700	.001533	
10,250	41,000	.003900	.000900	....	....	
10,500	42,000	.005367	.001467	....	....	
10,750	43,000	.006433	.001066	....	....	
11,000	44,000	.007333	.000900	....	....	
11,250	45,000	.008467	.001134	.006833	.005133	
11,500	46,000	.009567	.001100	....	....	
11,750	47,000	.010233	.000666	....	....	
12,000	48,000	.011500	.001267	....	....	
12,250	49,000	.012667	.001167	....	....	
12,500	50,000	.014367	.001700	.012333	.005500	
12,750	51,000	.015033	.000666	....	....	
13,000	52,000	.016067	.001034	....	....	
13,250	53,000	.017167	.001100	....	....	
13,500	54,000	.018833	.001666	....	....	
13,750	55,000	.020333	.001500	....	....	
14,000	56,000	.022000	.001667	....	....	
14,250	57,000	.023067	.001067	....	....	
14,500	58,000	.024933	.001866	....	....	
14,750	59,000	.027000	.002067	....	....	
15,000	60,000	.029000	.002000	....	....	
15,500	62,000	.031833	.002833	....	....	
16,000	64,000	.036833	.005000	....	....	
16,500	66,000	.041333	.004500	....	....	
17,000	68,000	.047067	.005734	....	....	
17,500	70,000	.054000	.006933	....	....	
18,000	72,000	.064500	.010500	....	....	
18,500	74,000	.076000	.011500	....	....	
19,000	76,000	.0967	.0207	....	....	
19,300	77,200	.1433	.0466	....	....	Tensile strength.
16,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section.................................pounds.. 77,200
Elastic limit per square inch of original section ....do.... 37,000
Elongation per inch after rupture..inch.. 0.2267
Elongation per inch under strain at elastic limit...do.... .001300
Reduction in diameter at point of rupture ....do.... .154
Reduction in area after rupture, per centum of original section 47.2
Position of rupture.. 1″.10 from neck
Character of broken surface..silky
Elongation of inch sections ....″.39,* ″.19, ″.10

No. 884.

Marks, $\overset{8}{B}\ \overset{Tu}{T_cM}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	.000033	.000033	
8,750	35,000	.001133	.000166	.000067	.000034	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001267	.000067	....	....	Elastic limit.
9,500	38,000	.001433	.000166	....	....	
9,750	39,000	.002500	.001067	....	....	
10,000	40,000	.004900	.002400	.003500	.003433	
10,250	41,000	.005800	.000900	....	....	
10,500	42,000	.007000	.001200	....	....	
10,750	43,000	.008000	.001000	....	....	
11,000	44,000	.009000	.001000	....	....	
11,250	45,000	.010000	.001000	.008367	.004867	
11,500	46,000	.011500	.001500	....	....	
11,750	47,000	.012400	.000900	....	....	
12,000	48,000	.013567	.001167	....	....	
12,250	49,000	.014767	.001200	....	....	
12,500	50,000	.016033	.001266	.014067	.005700	
12,750	51,000	.017067	.001034	....	....	
13,000	52,000	.018667	.001600	....	....	
13,250	53,000	.020500	.001833	....	....	
13,500	54,000	.022000	.001500	....	....	
13,750	55,000	.023167	.001167	....	....	
14,000	56,000	.024967	.001800	....	....	
14,250	57,000	.026667	.001700	....	....	
14,500	58,000	.028567	.001900	....	....	
14,750	59,000	.030333	.001766	....	....	
15,000	60,000	.032833	.002500	....	....	
15,500	62,000	.037500	.004667	....	....	
16,000	64,000	.042533	.005033	....	....	
16,500	66,000	.048000	.005467	....	....	
17,000	68,000	.058333	.010333	....	....	
17,200	68,800	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	68,800
Elastic limit per square inch of original section	do ...	37,000
Elongation per inch after rupture	inch..	0.0633
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.033
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		at middle of stem
Character of broken surface		fine granular; blow-hole in broken surface
Elongation of inch sections		″.05, ″.09*, ″.05

No. 385.

Marks, $^{8\,T_{15}}_{B\,T_7\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	.000033	.000033	
8,750	35,000	.001100	.000167	.000033	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001267	.000034	....	....	Elastic limit.
10,000	40,000	.001367	.000100	.000133	.000100	
10,250	41,000	.002000	.000633	....	....	
10,500	42,000	.003333	.001333	....	....	
10,750	43,000	.004633	.001300	....	....	
11,000	44,000	.006167	.001534	....	....	
11,250	45,000	.007400	.001233	.005767	.005634	
11,500	46,000	.008267	.000867	....	....	
11,750	47,000	.009000	.000733	....	....	
12,000	48,000	.010333	.001333	....	....	
12,250	49,000	.011367	.001034	....	....	
12,500	50,000	.012667	.001300	.010667	.004900	
12,750	51,000	.013267	.000600	....	....	
13,000	52,000	.014333	.001066	....	....	
13,250	53,000	.016000	.001667	....	....	
13,500	54,000	.017667	.001667	....	....	
13,750	55,000	.019000	.001333	....	....	
14,000	56,000	.020333	.001333	....	....	
14,250	57,000	.021933	.001600	....	....	
14,500	58,000	.023400	.001467	....	....	
14,750	59,000	.024833	.001433	....	....	
15,000	60,000	.026667	.001834	....	....	
15,500	62,000	.031000	.004333	....	....	
16,000	64,000	.034500	.003500	....	....	
16,500	66,000	.039333	.004833	....	....	
17,000	68,000	.044333	.005000	....	....	
17,500	70,000	.053000	.008667	....	....	
18,000	72,000	.063167	.010167	....	....	Surface crack opened.
18,500	74,000	.0833	.020133	....	....	
19,000	76,000	.1000	.0167	....	....	
19,180	76,720	.1300	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	76,720
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.75 from middle of stem, oblique
Character of surface		silky
Elongation of inch sections		″.26*, ″.18, ″.10

TUBE No. 16.—8″ *Converted Rifle.*

No. 852.

Marks, $\overset{8\,T_{16}}{B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001167	.000200	.000033	.000033	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000100	.000067	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.001667	.000267	....	....	
10,750	43,000	.002133	.000466	....	....	
11,000	44,000	.002833	.000700	....	....	
11,250	45,000	.003333	.000500	.001967	.001867	
11,500	46,000	.004733	.001400	....	....	
11,750	47,000	.006300	.001567	....	....	
12,000	48,000	.007500	.001200	....	....	
12,250	49,000	.008633	.001133	....	....	
12,500	50,000	.010000	.001367	.008133	.006166	
12,750	51,000	.010833	.000833	....	....	
13,000	52,000	.011667	.000834	....	....	
13,250	53,000	.013000	.001333	....	....	
13,500	54,000	.014667	.001667	....	....	
13,750	55,000	.015700	.001033	....	....	
14,000	56,000	.017233	.001533	....	....	
14,250	57,000	.018500	.001267	....	....	
14,500	58,000	.020000	.001500	....	....	
14,750	59,000	.021833	.001833	....	....	
15,000	60,000	.023233	.001900	....	....	
15,500	62,000	.027333	.004100	....	....	
16,000	64,000	.030433	.003100	....	....	
16,500	66,000	.034933	.004500	....	....	
17,000	68,000	.039333	.004400	....	....	
17,500	70,000	.045000	.005667	....	....	
18,000	72,000	.052333	.007333	....	....	
18,500	74,000	.062333	.010000	....	....	
19,000	76,000	.0733	.010967	....	....	
19,500	78,000	.0967	.0234	....	....	
19,600	78,400	.1300	.0333	....	....	Tensile strength.
16,700	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8586
Hardness	11.59
Tensile strength per square inch of original section ....pounds..	78,400
Elastic limit per square inch of original section ....do ...	41,000
Elongation per inch after rupture ....inch..	0.2033
Elongation per inch under strain at elastic limit ....do....	.001400
Reduction in diameter at point of rupture ....do....	.174.
Reduction in area after rupture, per centum of original section	52.2.
Position of rupture	″.6 from neck
Character of broken surface	silky
Elongation of inch sections	″.42*, ″.11, ″.08

No. 853.

Marks, $\substack{8\,T_{18}\\B\,T_{3}\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001100	.000133	.000033	.000033	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000033	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001400	.000067	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	Elastic limit.
11,250	45,000	.001600	.000133	.000200	.000167	
11,500	46,000	.004667	.003067	....	....	
11,750	47,000	.005833	.001166	....	....	
12,000	48,000	.006433	.000600	....	....	
12,250	49,000	.007333	.000900	....	....	
12,500	50,000	.008267	.000934	.006500	.000300	
12,750	51,000	.009000	.000733	....	....	
13,000	52,000	.009967	.000967	....	....	
13,250	53,000	.010933	.000966	....	....	
13,500	54,000	.012133	.001200	....	....	
13,750	55,000	.013000	.000867	....	....	
14,000	56,000	.014233	.001233	....	....	
14,250	57,000	.015433	.001200	....	....	
14,500	58,000	.016667	.001234	....	....	
14,750	59,000	.017667	.001000	....	....	
15,000	60,000	.019033	.001366	....	....	
15,500	62,000	.021833	.002800	....	....	
16,000	64,000	.024733	.002900	....	....	
16,500	66,000	.028500	.003767	....	....	
17,000	68,000	.031500	.003000	....	....	
17,500	70,000	.035667	.004167	....	....	
18,000	72,000	.040000	.004333	....	....	
18,500	74,000	.045500	.005500	....	....	
19,000	76,000	.051667	.006167	....	....	
19,500	78,000	.061000	.009333	....	....	
20,000	80,000	.0700	.0090	....	....	
20,500	82,000	.0900	.0200	....	....	
20,950	83,800	.1600	.0700	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	83,800
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2133
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		at middle of stem

Character of broken surface....silky, 70 per centum; granular, 30 per centum; cracks developed in the cylindrical surface of stem.

Elongation of inch sections..".16, ".34*, ".14

No. 884.

Marks, $\overset{8\ \mathrm{T}_{15}}{\mathrm{B\ T_eM}}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	.000033	.000033	
8,750	35,000	.001133	.000166	.000067	.000034	
9,000	36,000	.001200	.000067	....	....	
9,250	37,000	.001267	.000067	....	....	Elastic limit.
9,500	38,000	.001433	.000166	....	....	
9,750	39,000	.002500	.001067	....	....	
10,000	40,000	.004900	.002400	.003500	.003433	
10,250	41,000	.005800	.000900	....	....	
10,500	42,000	.007000	.001200	....	....	
10,750	43,000	.008000	.001000	....	....	
11,000	44,000	.009000	.001000	....	....	
11,250	45,000	.010000	.001000	.006367	.004867	
11,500	46,000	.011500	.001500	....	....	
11,750	47,000	.012400	.000900	....	....	
12,000	48,000	.013567	.001167	....	....	
12,250	49,000	.014767	.001200	....	....	
12,500	50,000	.016033	.001266	.014067	.005700	
12,750	51,000	.017067	.001034	....	....	
13,000	52,000	.018667	.001600	....	....	
13,250	53,000	.020500	.001833	....	....	
13,500	54,000	.022000	.001500	....	....	
13,750	55,000	.023167	.001167	....	....	
14,000	56,000	.024967	.001800	....	....	
14,250	57,000	.026667	.001700	....	....	
14,500	58,000	.028567	.001900	....	....	
14,750	59,000	.030333	.001766	....	....	
15,000	60,000	.032833	.002500	....	....	
15,500	62,000	.037500	.004667	....	....	
16,000	64,000	.042533	.005033	....	....	
16,500	66,000	.048000	.005467	....	....	
17,000	68,000	.058333	.010333	....	....	
17,200	68,800	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	68,800
Elastic limit per square inch of original section	do ...	37,000
Elongation per inch after rupture	inch..	0.0633
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.033
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		at middle of stem
Character of broken surface		fine granular; blow-hole in broken surface
Elongation of inch sections		″.05, ″.09*, ″.05

No. 855.

Marks, $^{8\ T_{16}}_{M\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	0.	....	
2,500	10,000	.000167	.000134	0.	....	
3,750	15,000	.000300	.000133	0.	....	
5,000	20,000	.000433	.000133	0.	....	
6,250	25,000	.000633	.000200	0.	....	
7,500	30,000	.000767	.000134	0.	....	
8,750	35,000	.000900	.000133	0.	....	
9,000	36,000	.000933	.000033	....	....	
9,250	37,000	.000967	.000034	....	....	
9,500	38,000	.001000	.000033	....	....	
9,750	39,000	.001033	.000033	....	....	
10,000	40,000	.001067	.000034	0.	....	
10,250	41,000	.001100	.000033	....	....	
10,500	42,000	.001133	.000033	....	....	
10,750	43,000	.001167	.000034	....	....	
11,000	44,000	.001200	.000033	....	....	
11,250	45,000	.001233	.000033	0.	....	
11,500	46,000	.001267	.000034	....	....	
11,750	47,000	.001300	.000033	....	....	
12,000	48,000	.001333	.000033	....	....	Elastic limit.
12,250	49,000	.001467	.000134	....	....	
12,500	50,000	.001667	.000200	.000167	.000167	
12,750	51,000	.002167	.000500	....	....	
13,000	52,000	.003167	.001000	....	....	
13,250	53,000	.004167	.001000	....	....	
13,500	54,000	.006000	.001833	....	....	
13,750	55,000	.007233	.001233	....	....	
14,000	56,000	.008433	.001200	....	....	
14,250	57,000	.009667	.001234	....	....	
14,500	58,000	.011000	.001333	....	....	
14,750	59,000	.011867	.000867	....	....	
15,000	60,000	.012733	.000866	....	....	
15,500	62,000	.014733	.002000	....	....	
16,000	64,000	.017000	.002267	....	....	
16,500	66,000	.019667	.002667	....	....	
17,000	68,000	.022667	.003000	....	....	
17,500	70,000	.025500	.002833	....	....	
18,000	72,000	.028600	.003100	....	....	
18,500	74,000	.032333	.003700	....	....	
19,000	76,000	.036333	.004000	....	....	
19,500	78,000	.040000	.003667	....	....	
20,000	80,000	.046000	.006000	....	....	
20,500	82,000	.052833	.006833	....	....	
21,000	84,000	.062167	.009334	....	....	
21,500	86,000	.0733	.011133	....	....	
21,970	87,880	.1233	.0500	....	....	Tensile strength.

General summary.

Specific gravity		7.8390
Hardness		12.30
Tensile strength per square inch of original section	pounds..	87,880
Elastic limit per square inch of original section	do ...	48,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		at middle of stem
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.10, ″.30 ″.14

TUBE No. 16.—8″ *Converted Rifle.*

No. 852.

Marks, $\overset{8\ T_{16}}{B\ T_1\ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000800	.000200	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001167	.000200	.000033	.000033	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000100	.000067	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.001667	.000267	....	....	
10,750	43,000	.002133	.000466	....	....	
11,000	44,000	.002833	.000700	....	....	
11,250	45,000	.003333	.000500	.001967	.001867	
11,500	46,000	.004733	.001400	....	....	
11,750	47,000	.006300	.001567	....	....	
12,000	48,000	.007500	.001200	....	....	
12,250	49,000	.008633	.001133	....	....	
12,500	50,000	.010000	.001367	.008133	.006166	
12,750	51,000	.010833	.000833	....	....	
13,000	52,000	.011667	.000834	....	....	
13,250	53,000	.013000	.001333	....	....	
13,500	54,000	.014667	.001667	....	....	
13,750	55,000	.015700	.001033	....	....	
14,000	56,000	.017233	.001533	....	....	
14,250	57,000	.018500	.001267	....	....	
14,500	58,000	.020000	.001500	....	....	
14,750	59,000	.021833	.001833	....	....	
15,000	60,000	.023233	.001900	....	....	
15,500	62,000	.027333	.004100	....	....	
16,000	64,000	.030433	.003100	....	....	
16,500	66,000	.034933	.004500	....	....	
17,000	68,000	.039333	.004400	....	....	
17,500	70,000	.045000	.005667	....	....	
18,000	72,000	.052333	.007333	....	....	
18,500	74,000	.062333	.010000	....	....	
19.000	76,000	.0733	.010967	....	....	
19,500	78,000	.0967	.0234	....	....	
19,600	78,400	.1300	.0333	....	....	Tensile strength.
16,700	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8586
Hardness		11.59
Tensile strength per square inch of original section	pounds..	78,400
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2038
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.174.
Reduction in area after rupture, per centum of original section		52.2.
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.42*, ″.11, ″.08

No. 857.

Marks, $\overset{8\ T_{16}}{M\ T_3\ M}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000367	.000100	0.	....	
5,000	20,000	.000567	.000200	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001167	.000067	....	....	
9,750	39,000	.001233	.000066	....	....	Elastic limit.
10,000	40,000	.001400	.000167	....	....	
10,250	41,000	.002600	.001200	....	....	
10,500	42,000	.003533	.000933	....	....	
10,750	43,000	.004233	.000700	....	....	
11,000	44,000	.005933	.001700	....	....	
11,250	45,000	.006900	.000967	.005267	.005267	
11,500	46,000	.008167	.001267	....	....	
11,750	47,000	.008967	.000800	....	....	
12,000	48,000	.010333	.001366	....	....	
12,250	49,000	.011333	.001000	....	....	
12,500	50,000	.012667	.001334	.010833	.005566	
12,750	51,000	.013167	.000500	....	....	
13,000	52,000	.014333	.001166	....	....	
13,250	53,000	.016000	.001667	....	....	
13,500	54,000	.017667	.001667	....	....	
13,750	55,000	.019000	.001333	....	....	
14,000	56,000	.020333	.001333	....	....	
14,250	57,000	.021733	.001400	....	....	
14,500	58,000	.023267	.001534	....	....	
14,750	59,000	.024933	.001666	....	....	
15,000	60,000	.026733	.001800	....	....	
15,500	62,000	.030567	.003834	....	....	
16,000	64,000	.034667	.004100	....	....	
16,500	66,000	.040000	.005333	....	....	
17,000	68,000	.046000	.006000	....	....	
17,500	70,000	.054000	.008000	....	....	
18,000	72,000	.064667	.010667	....	....	
18,500	74,000	.0767	.012033	....	....	
19,000	76,000	.1033	.0266	....	....	
19,140	76,560	.1400	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	76,560
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.1567
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.173
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".50 from middle of stem
Character of broken surface		silky; cracks developed in the cylindrical surface of stem
Elongation of inch sections		".14, ".22*, ".11

TUBE No. 17.—8″ *Converted Rifle.*

No. 792.

Marks, $\begin{smallmatrix}8 & T_{II}\\ B & T_1\ I\end{smallmatrix}$
***Diameter,* ″.564.**
***Sectional area,* .25 square inch.**

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000583	.000283	0.		
5,000	20,000	.000700	.000167	0.		
6,250	25,000	.000867	.000167	0.		
7,500	30,000	.001033	000166	0.		
8,750	35,000	.001200	.000167	.000033	.000033	
9,000	36,000	.001233	.000033			
9,250	37,000	.001267	.000034			
9,500	38,000	.001300	.000033			
9,750	39,000	.001333	.000033			
10,000	40,000	.001367	.000034	.000100	.000067	
10,250	41,000	.001400	.000033			
10,500	42,000	.001467	.000067			
10,750	43,000	.001533	.000066			Elastic limit.
11,000	44,000	.002267	.000734			
11,250	45,000	.002900	.000633	.001367	.001267	
11,500	46,000	.003600	.000700			
11,750	47,000	.004400	.000800			
12,000	48,000	.005600	.001200			
12,250	49,000	.006667	.001067			
12,500	50,000	.007733	.001066	.005867	.004500	
12,750	51,000	.008600	.000867			
13,000	52,000	.009567	.000967			
13,250	53,000	.010467	.000900			
13,500	54,000	.011667	.001200			
13,750	55,000	.012900	.001233			
14,000	56,000	.014000	.001100			
14,250	57,000	.015167	.001167			
14,500	58,000	.016633	.001466			
14,750	59,000	.017700	.001067			
15,000	60,000	.019267	.001567			
15,500	62,000	.022033	.002766			
16,000	64,000	.025667	.003634			
16,500	66,000	.029333	.003666			
17,000	68,000	.032833	.003500			
17,500	70,000	.037067	.004234			
18,000	72,000	.041700	.004633			
18,500	74,000	.047667	.005967			
19,000	76,000	.057000	.009333			
19,500	78,000	.066333	.009333			
20,000	80,000	.0833	.016967			
20,360	81,440	.1267	.0434			Tensile strength.

General summary.

Specific gravity		7.8609
Hardness		12.84
Tensile strength per square inch of original section	pounds..	81,440
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		″.4 from neck
Character of broken surface		granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.22*, ″.11, ″.08

No. 793.

Marks, $^{8\,T_{17}}_{B\,T_3\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001100	0.	....	....	
9, 250	37, 000	.001133	.000033	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001200	.000033	....	....	
10, 000	40, 000	.001233	.000033	0.	....	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001367	.000067	....	....	Elastic limit.
11, 000	44, 000	.001600	.000233	....	....	
11, 250	45, 000	.001933	.000333	.000567	.000567	
11. 500	46, 000	.002833	.000900	....	....	
11, 750	47, 000	.003267	.000434	....	....	
12, 000	48, 000	.004233	.000966	....	....	
12, 250	49, 000	.004967	.000734	....	....	
12, 500	50, 000	.006100	.001133	.004267	.003700	
12, 750	51, 000	.006900	.000800	....	....	
13, 000	52, 000	.007733	.000833	....	....	
13, 250	53, 000	.008567	.000834	....	....	
13, 500	54, 000	.009600	.001033	....	....	
13, 750	55, 000	.010333	.000733	....	....	
14, 000	56, 000	.011933	.001600	....	....	
14, 250	57, 000	.012667	.000734	....	....	
14, 500	58, 000	.013767	.001100	....	....	
14, 750	59, 000	.014767	.001000	....	....	
15, 000	60, 000	.016267	.001500	....	....	
15, 500	62, 000	.018500	.002233	....	....	
16, 000	64, 000	.021133	.002633	....	....	
16, 500	66, 000	.023900	.002767	....	....	
17, 000	68, 000	.026667	.002767	....	....	
17, 500	70, 000	.030000	.003333	....	....	
18, 000	72, 000	.033733	.003733	....	....	
18, 500	74, 000	.037833	.004100	....	....	
19, 000	76, 000	.042500	.004667	....	....	
19, 500	78, 000	.048000	.005500	....	....	
20, 000	80, 000	.055500	.007500	....	....	
20, 500	82, 000	.064667	.009167	....	....	
21, 000	84, 000	.0867	.022033	....	....	
21, 500	86, 000	.1067	.0200	....	....	
21, 600	86, 400	.1300	.0233	....	....	Tensile strength.
18, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section................................pounds.. 86, 400
Elastic limit per square inch of original section....................................do.... 43, 000
Elongation per inch after rupture..inch.. 0. 2333
Elongation per inch under strain at elastic limit....................................do.... .001367
Reduction in diameter at point of rupture..do.... .154
Reduction in area after rupture, per centum of original section..................................... 47. 2
Position of rupture...".5 from middle of stem
Character of broken surface.. silky
Elongation of inch sections...".21, ".36*, ".13

No. 794.

Marks, $B\ {}^{8\ T_{17}}_{T_3\ M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000033	0.	
6,250	25,000	.000833	.000166	.000067	.000034	
7,500	30,000	.001000	.000167	.000067	0.	
8,750	35,000	.001167	.000167	.000100	.000033	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001367	.000067	.000133	.000033	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	Elastic limit.
10,750	43,000	.001700	.000267	....	....	
11,000	44,000	.002600	.000900	....	....	
11,250	45,000	.003833	.001233	.002267	.002134	
11,500	46,000	.005067	.001234	....	....	
11,750	47,000	.005500	.000433	....	....	
12,000	48,000	.006600	.001100	....	....	
12,250	49,000	.007400	.000800	....	....	
12,500	50,000	.008767	.001367	.006900	.004633	
12,750	51,000	.009667	.000900	....	....	
13,000	52,000	.010233	.000566	....	....	
13,250	53,000	.011100	.000867	....	....	
13,500	54,000	.012333	.001233	....	....	
13,750	55,000	.013500	.001167	....	....	
14,000	56,000	.014467	.000967	....	....	
14,250	57,000	.015467	.001000	....	....	
14,500	58,000	.016733	.001266	....	....	
14,750	59,000	.018000	.001267	....	....	
15,000	60,000	.019333	.001333	....	....	
15,500	62,000	.022000	.002667	....	....	
16,000	64,000	.024833	.002833	....	....	
16,500	66,000	.028067	.003234	....	....	
17,000	68,000	.031667	.003600	....	....	
17,500	70,000	.035400	.003733	....	....	
18,000	72,000	.040500	.005100	....	....	
18,500	74,000	.045667	.005167	....	....	
19,000	76,000	.052333	.006666	....	....	
19,500	78,000	.061167	.008834	....	....	
20,000	80,000	.073333	.012166	....	....	
20,500	82,000	.0967	.023367	....	....	
20,820	83,280	.1433	.0466	....	....	Tensile strength.
18,280	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	83,280
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.2283
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		".9 from neck
Character of broken surface		granular, 60 per centum; silky, 40 per centum
Elongation of inch sections		".31*, ".22, ".14

No. 795.

Marks, $\overset{8\,T_{17}}{M\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	—.000033	—.000033	
9,000	36,000	.001033	0.	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001167	.000034	—.000033	0.	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	Elastic limit.
11,250	45,000	.001467	.000167	.000133	.000166	
11,500	46,000	.001800	.000333	....	....	
11,750	47,000	.002267	.000467	....	....	
12,000	48,000	.003333	.001066	....	....	
12,250	49,000	.004333	.001000	....	....	
12,500	50,000	.005833	.001500	.004100	.003967	
12,750	51,000	.006633	.000800	....	....	
13,000	52,000	.007400	.000767	....	....	
13,250	53,000	.008433	.001033	....	....	
13,500	54,000	.009733	.001300	....	....	
13,750	55,000	.010700	.000967	....	....	
14,000	56,000	.012267	.001567	....	....	
14,250	57,000	.013033	.000766	....	....	
14,500	58,000	.014333	.001300	....	....	
14,750	59,000	.015367	.001034	....	....	
15,000	60,000	.016733	.001366	....	....	
15,500	62,000	.019567	.002834	....	....	
16,000	64,000	.022233	.002566	....	....	
16,500	66,000	.025333	.003100	....	....	
17,000	68,000	.028667	.003334	....	....	
17,500	70,000	.032267	.003600	....	....	
18,000	72,000	.037000	.004733	....	....	
18,500	74,000	.041667	.004667	....	....	
19,000	76,000	.047667	.006000	....	....	
19,500	78,000	.054833	.007166	....	....	
20,000	80,000	.065033	.010200	....	....	
20,500	82,000	.0933	.028267	....	....	
20,850	83,400	.1167	.0234	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8601
Hardness		13.85
Tensile strength per square inch of original section	pounds..	83,400
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do...	.001300
Reduction in diameter at point of rupture	do...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″.3 from neck, oblique
Character of broken surface		silky
Elongation of inch sections		″.24, ″.29, ″.07

No. 796.

Marks, $^{8}_{M}{}^{T_{17}}_{T_{3}}O$
Diameter, *".564.*
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000067	—.000067	
2,500	10,000	.000200	.000133	—.000067	0.	
3,750	15,000	.000367	.000167	—.000067	0.	
5,000	20,000	.000567	.000200	—.000067	0.	
6,250	25,000	.000700	.000133	—.000067	0.	
7,500	30,000	.000900	.000200	—.000067	0.	
8,750	35,000	.001033	.000133	—.000067	0.	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001233	.000066	—.000033	.000034	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001400	.000067	....	....	
11,250	45,000	.001467	.000067	.000033	.000066	Elastic limit.
11,500	46,000	.001600	.000133	....	....	
11,750	47,000	.001733	.000133	....	....	
12,000	48,000	.002000	.000267	....	....	
12,250	49,000	.002400	.000400	....	....	
12,500	50,000	.003433	.001033	.001700	.001607	
12,750	51,000	.004233	.000800	....	....	
13,000	52,000	.005067	.000834	....	....	
13,250	53,000	.005733	.000666	....	....	
13,500	54,000	.006767	.001034	....	....	
13,750	55,000	.007967	.001200	....	....	
14,000	56,000	.008933	.000966	....	....	
14,250	57,000	.009667	.000734	....	....	
14,500	58,000	.010667	.001000	....	....	
14,750	59,000	.011700	.001033	....	....	
15,000	60,000	.013000	.001300	....	....	
15,500	62,000	.015000	.002000	....	....	
16,000	64,000	.017067	.002067	....	....	
16,500	66,000	.019533	.002466	....	....	
17,000	68,000	.021667	.002134	....	....	
17,500	70,000	.025000	.003333	....	....	
18,000	72,000	.027667	.002667	....	....	
18,500	74,000	.030700	.003033	....	....	
19,000	76,000	.035000	.004300	....	....	
19,500	78,000	.038667	.003667	....	....	
20,000	80,000	.044500	.005833	....	....	
20,500	82,000	.049500	.005000	....	....	
21,000	84,000	.059333	.009833	....	....	
21,500	86,000	.0700	.010667	....	....	
22,000	88,000	.0933	.0233	....	....	
22,380	89,520	.1300	.0367	....	....	Tensile strength.
22,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 89, 52
Elastic limit per square inch of original section ....do... 45, 00
Elongation per inch after rupture...inch.. 0. 183
Elongation per inch under strain at elastic limit..................................do... .00146
Elongation per inch at point of rupture..................................do... .11
Reduction in diameter at point of rupture..
Reduction in area after rupture, per centum of original section .... 36.
Position of rupture ....".45 from middle of sten
Character of broken surface.................................granular; dull spot at circumference
Elongation of inch sections...".11, ".30*, ".1

No. 797.

Marks $^{8\,T_{17}}_{M\,T_3\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000400	.000133	0.		
5,000	20,000	.000600	.000200	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001067	.000134	0.		
9,000	36,000	.001100	.000033			
9,250	37,000	.001133	.000033			
9,500	38,000	.001167	.000034			
9,750	39,000	.001200	.000033			
10,000	40,000	.001233	.000033	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001367	.000034			
11,250	45,000	.001400	.000033	.000067	.000067	Elastic limit.
11,500	46,000	.001600	.000200			
11,750	47,000	.001667	.000067			
12,000	48,000	.001867	.000200			
12,250	49,000	.002267	.000400			
12,500	50,000	.003333	.001066	.001700	.001633	
12,750	51,000	.004033	.000700			
13,000	52,000	.004600	.000567			
13,250	53,000	.005267	.000667			
13,500	54,000	.006533	.001266			
13,750	55,000	.007267	.000734			
14,000	56,000	.008300	.001033			
14,250	57,000	.009333	.001033			
14,500	58,000	.010167	.000834			
14,750	59,000	.011000	.000833			
15,000	60,000	.012133	.001133			
15,500	62,000	.014000	.001867			
16,000	64,000	.016233	.002233			
16,500	66,000	.018333	.002100			
17,000	68,000	.020933	.002600			
17,500	70,000	.023267	.002334			
18,000	72,000	.026333	.003066			
18,500	74,000	.029667	.003334			
19,000	76,000	.033167	.003500			
19,500	78,000	.037667	.004500			
20,000	80,000	.041733	.004066			
20,500	82,000	.046000	.004267			
21,000	84,000	.051933	.005933			
21,500	86,000	.060400	.008467			
22,000	88,000	.071500	.011100			
22,500	90,000	.1033	.0318			
22,700	90,800	.1233	.0200			Tensile strength.
21,200						Load at time of rupture.

General summary.

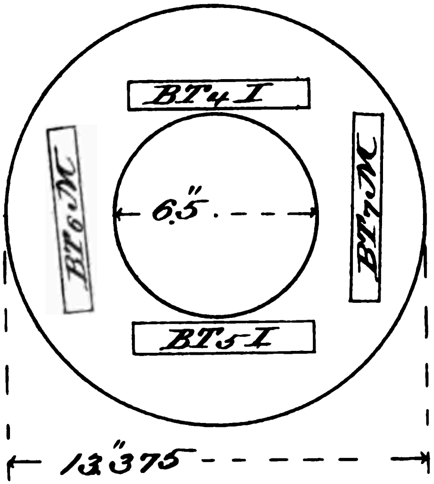
Tensile strength per square inch of original section	pounds..	90,800
Elastic limit per square inch of original section	do...	45,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do...	.001400
Reduction in diameter at point of rupture	do...	.104
Reduction in area after rupture, per centum. of original section		83.5
Position of rupture		".5 from neck
Character of broken surface		granular, radiating from center; dull spot at circumference
Elongation of inch sections		".27*, ".12, ".10

8" Converted Rifle

Tube No. 17

Additional Specimens

Breech



S Ex 36 49 1

No. 900.

Marks, $^{8\,T_{17}}_{B\,T_4\,I}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000567	.000234	0.	....	
5,000	20,000	.000667	.000100	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.000967	.000134	0.	....	
8,750	35,000	.001133	.000166	0.	....	
9,000	36,000	001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000033	.000033	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.001833	.000433	....	....	
10,750	43,000	.003000	.001167	....	....	
11,000	44,000	.004133	.001133	....	....	
11,250	45,000	.006400	.002267	.004833	.004800	
11,500	46,000	.007800	.001400	....	....	
11,750	47,000	.008467	.000667	....	....	
12,000	48,000	.009800	.001333	....	....	
12,250	49,000	.011000	.001200	....	....	
12,500	50,000	.012500	.001500	.010733	.005900	
12,750	51,000	.013167	.000667	....	....	
13,000	52,000	.014333	.001166	....	....	
13,250	53,000	.015600	.001267	....	....	
13,500	54,000	.017667	.002067	....	....	
13,750	55,000	.019267	.001600	....	....	
14,000	56,000	.020933	.001666	....	....	
14,250	57,000	.022000	.001067	....	....	
14,500	58,000	.023733	.001733	....	....	
14,750	59,000	.025500	.001767	....	....	
15,000	60,000	.027500	.002000	....	....	
15,500	62,000	.031500	.004000	....	....	
16,000	64,000	.035667	.004167	....	....	
16,500	66,000	.040833	.005166	....	....	
17,000	68,000	.047333	.006500	....	....	
17,500	70,000	.055000	.007667	....	....	
18,000	72,000	.066667	.011667	....	....	
18,500	74,000	.080667	.014000	....	....	
19,000	76,000	.1300	.049333	....	....	
19,070	76,280	.1567	.0267	....	....	Tensile strength.
15,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	76,280
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2433
Elongation per inch under strain at elastic limit	do ...	.001400
Reduction in diameter at point of rupture	do....	.193
Reduction in area after rupture, per centum of original section	...	57.0
Position of rupture		1" from neck
Character of broken surface	.. ..	silky
Elongation of inch sections		".43*, ".18, ".12

No. 901.

Marks, $\frac{8\,T_{17}}{B\,T_5\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000333	.000233	0.	....	
3,750	15,000	.000433	.000100	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	Elastic limit.
11,000	44,000	.001933	.000566	....	....	
11,250	45,000	.003167	.001234	.001667	.001667	
11,500	46,000	.006667	.003500	....	....	
11,750	47,000	.067333	.000666	....	....	
12,000	48,000	.008500	.001167	....	....	
12,250	49,000	.009167	.000667	....	....	
12,500	50,000	.011167	.002000	.009300	.007633	
12,750	51,000	.011800	.000633	....	....	
13,000	52,000	.012633	.000833	....	....	
13,250	53,000	.013733	.001100	....	....	
13,500	54,000	.015333	.001600	....	....	
13,750	55,000	.016667	.001333	....	....	
14,000	56,000	.018000	.001333	....	....	
14,250	57,000	.019500	.001500	....	....	
14,500	58,000	.021167	.001667	....	....	
14,750	59,000	.022400	.001233	....	....	
15,000	60,000	.024667	.002267	....	....	
15,500	62,000	.028033	.003366	....	....	
16,000	64,000	.032000	.003967	....	....	
16,500	66,000	.037000	.005000	....	....	
17,000	68,000	.041667	.004667	....	....	
17,500	70,000	.048667	.007000	....	....	
18,000	72,000	.056333	.007666	....	....	
18,500	74,000	.067833	.011500	....	....	
19,000	76,000	.085167	.017334	....	....	
19,420	77,680	.1467	.061533	....	....	Tensile strength.
16,200	....	....	....	....	....	Load at time of rupture.

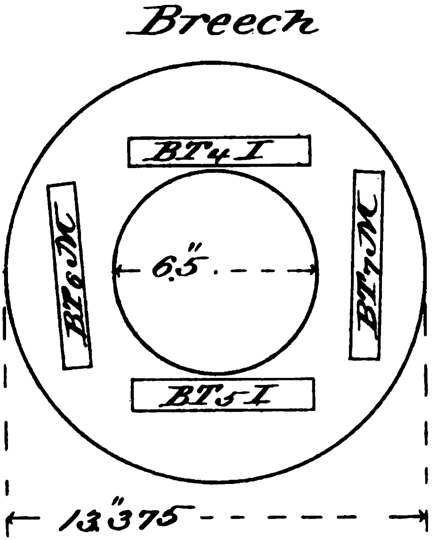
General summary.

Tensile strength per square inch of original section	pounds..	77,680
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2667
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		″.75 from middle of stem
Character of broken surface		fine silky
Elongation of inch sections		″.37*, ″.28, ″.15

8" Converted Rifle

Tube No. 17

Additional Specimens



S Ex 36 49 1

No. 903.

Marks, $^{8\,T_{17}}_{B\,T_{7}\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000433	.000200	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001133	0.	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001233	.000066	....	....	Elastic limit.
10,000	40,000	.003200	.001967	.002033	.002033	
10,250	41,000	.005133	.001933	....	....	
10,500	42,000	.006100	.000967	....	....	
10,750	43,000	.007133	.001033	....	....	
11,000	44,000	.008033	.000900	....	....	
11,250	45,000	.009333	.001300	.007633	.005600	
11,500	46,000	.010667	.001334	....	....	
11,750	47,000	.011400	.000733	....	....	
12,000	48,000	.012700	.001300	....	....	
12,250	49,000	.013733	.001033	....	....	
12,500	50,000	.015267	.001534	.013333	.005700	
12,750	51,000	.015933	.000666	....	....	
13,000	52,000	.017200	.001267	....	....	
13,250	53,000	.018700	.001500	....	....	
13,500	54,000	.020400	.001700	....	....	
13,750	55,000	.021667	.001267	....	....	
14,000	56,000	.023000	.001333	....	....	
14,250	57,000	.024667	.001667	....	....	
14,500	58,000	.026833	.002166	....	....	
14,750	59,000	.028667	.001834	....	....	
15,000	60,000	.030400	.001733	....	....	
15,500	62,000	.034700	.004300	....	....	
16,000	64,000	.039167	.004467	....	....	
16,500	66,000	.045333	.006166	....	....	
17,000	68,000	.052500	.007167	....	....	
17,500	70,000	.061500	.009000	....	....	
18,000	72,000	.073333	.011833	....	....	
18,500	74,000	.090000	.016667	....	....	
18,920	75,680	.1467	.0567	....	....	Tensile strength.
15,500	....	....	....	....	....	Load at time of rupture.

General summary.

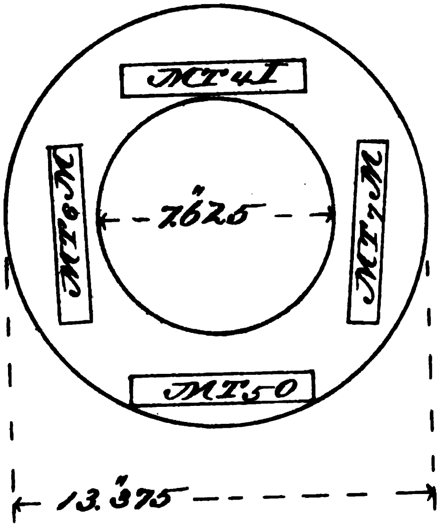
Tensile strength per square inch of original section	pounds..	75,680
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.2333
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		".75 from neck
Character of broken surface		fine silky
Elongation of inch sections		".44*, ".15, ".11

8" Converted Rifle

Tube No. 77

Additional specimens

Muzzle



S Ex 36 49 1

No. 904.

Marks, $\overset{8\ T_{17}}{M\ T_4 I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongaton per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	.000033	....	....	Elastic limit.
9,500	38,000	.002133	.000933	....	....	
9,750	39,000	.002600	.000467	....	....	
10,000	40,000	.004267	.001667	.002900	.002900	
10,250	41,000	.005733	.001466	....	....	
10,500	42,000	.006667	.000934	....	....	
10,750	43,000	.007500	.000833	....	....	
11,000	44,000	.008500	.001000	....	....	
11,250	45,000	.009800	.001300	.008233	.005333	
11,500	46,000	.010667	.000867	....	....	
11,750	47,000	.011333	.000666	....	....	
12,000	48,000	.012667	.001334	....	....	
12,250	49,000	.013933	.001266	....	....	
12,500	50,000	.015433	.001500	.013533	.005300	
12,750	51,000	.016033	.000600	....	....	
13,000	52,000	.017267	.001234	....	....	
13,250	53,000	.018333	.001066	....	....	
13,500	54,000	.020600	.002267	....	....	
13,750	55,000	.021700	.001100	....	....	
14,000	56,000	.023300	.001600	....	....	
14,250	57,000	.024967	.001667	....	....	
14,500	58,000	.026600	.001633	....	....	
14,750	59,000	.028167	.001567	....	....	
15,000	60,000	.033233	.005066	....	....	
15,500	62,000	.034167	.000934	....	....	
16,000	64,000	.038333	.004166	....	....	
16,500	66,000	.043333	.005000	....	....	
17,000	68,000	.050000	.006667	....	....	
17,500	70,000	.058000	.008000	....	....	
18,000	72,000	.068333	.010333	....	....	
18,500	74,000	.0900	.021667	....	....	
19,000	76,000	.1200	.0300	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	76,000
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section	..	18.3
Position of rupture		″.62 from neck
Character of broken surface		fine granular, radiating from a small blow-hole at circumference
Elongation of inch sections		″.16*, ″.10, ″.10

No. 905.

Marks, $^{8\,T_{17}}_{M\,T,\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000300	.000200	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000767	.000134	.000033	.000033	
7,500	30,000	.000933	.000166	.000033	0.	
8,750	35,000	.001133	.000200	.000067	.000034	
9,000	36,000	.001200	.000067			Elastic limit.
9,250	37,000	.002367	.001167			
9,500	38,000	.003667	.001300			
9,750	39,000	.004467	.000800			
10,000	40,000	.006800	.002333	.005033	.004966	
10,250	41,000	.007133	.000333			
10,500	42,000	.007933	.000800			
10,750	43,000	.008833	.000900			
11,000	44,000	.010000	.001167			
11,250	45,000	.011200	.001200	.009533	.004500	
11,500	46,000	.011833	.000633			
11,750	47,000	.012700	.000867			
12,000	48,000	.014033	.001333			
12,250	49,000	.015067	.001034			
12,500	50,000	.016533	.001466	.014500		
12,750	51,000	.018167	.001634			
13,000	52,000	.018933	.000766			
13,250	53,000	.020167	.001234			
13,500	54,000	.021333	.001166			
13,750	55,000	.023333	.002000			
14,000	56,000	.025000	.001667			
14,250	57,000	.026667	.001667			
14,500	58,000	.028167	.001500			
14,750	59,000	.030000	.001833			
15,000	60,000	.031667	.001667			
15,500	62,000	.035667	.004000			
16,000	64,000	.040000	.004333			
16,500	66,000	.045833	.005833			
17,000	68,000	.053333	.007500			
17,500	70,000	.060000	.006667			
18,000	72,000	.0667	.0067			
18,500	74,000	.0900	.0233			
19,000	76,000	.1167	.0267			
19,170	76,680	.1633	.0466			Tensile strength.
17,100						Load at time of rupture.

General summary.

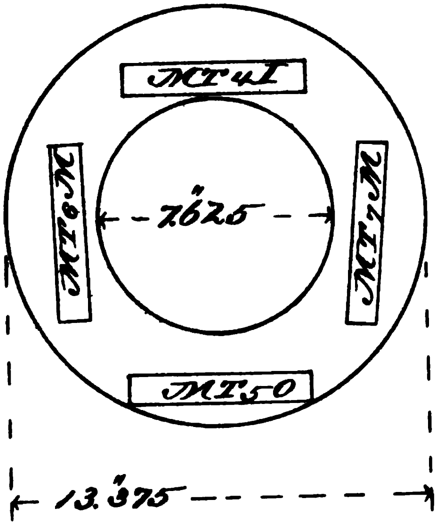
Tensile strength per square inch of original section........pounds.. 76,680
Elastic limit per square inch of original section........do .. 36,000
Elongation per inch after rupture........inch.. 0.2133
Elongation per inch under strain at elastic limit........do ... .001200
Reduction in diameter at point of rupture........do ... .124
Reduction in area after rupture, per centum of original section........ 39.2
Position of rupture........″.9 from neck
Character of broken surface........granular, 70 per centum; dull silky, 30 per centum
Elongation of inch sections........″.35, ″.17, ″.12

8" Converted Rifle

Tube No. 77

Additional specimens

Muzzle



S Ex 36 49 1

No. 907.

Marks, $^{8\ T_{17}}_{M\ T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.	....	
2, 500	10, 000	. 000267	. 000134	0.	....	
3, 750	15, 000	. 000400	. 000133	0.	....	
5, 000	20, 000	. 000600	. 000200	0.	....	
6, 250	25, 000	. 000733	. 000133	0.	....	
7, 500	30, 000	. 000900	. 000167	0.	....	
8, 750	35, 000	. 001067	. 000167	0.	....	
9, 000	36, 000	. 001100	. 000033	....	....	
9, 250	37, 000	. 001167	. 000067	....	....	
9, 500	38, 000	. 001200	. 000033	....	....	
9, 750	39, 000	. 001233	. 000033	....	....	
10, 000	40, 000	. 001267	. 000034	. 000067	. 000067	Elastic limit.
10, 250	41, 000	. 001400	. 000133	....	....	
10, 500	42, 000	. 001767	. 000367	....	....	
10, 750	43, 000	. 002600	. 000833	....	....	
11, 000	44, 000	. 004000	. 001400	....	....	
11, 250	45, 000	. 005067	. 001067	. 003533	. 003466	
11, 500	46, 000	. 005900	. 000833	....	....	
11, 750	47, 000	. 006667	. 000767	....	....	
12, 000	48, 000	. 008000	. 001333	....	....	
12, 250	49, 000	. 009033	. 001033	....	....	
12, 500	50, 000	. 010167	. 001134	. 008300	. 004767	
12, 750	51, 000	. 010867	. 000700	....	....	
13, 000	52, 000	. 012000	. 001133	....	....	
13, 250	53, 000	. 013067	. 001067	....	....	
13, 500	54, 000	. 014000	. 000933	....	....	
13, 750	55, 000	. 015000	. 001000	....	....	
14, 000	56, 000	. 016367	. 001367	....	....	
14, 250	57, 000	. 017600	. 001233	....	....	
14, 500	58, 000	. 019000	. 001400	....	....	
14, 750	59, 000	. 020333	. 001333	....	....	
15, 000	60, 000	. 021700	. 001367	....	....	
15, 500	62, 000	. 025000	. 003300	....	....	
16, 000	64, 000	. 028333	. 003333	....	....	
16, 500	66, 000	. 032000	. 003667	....	....	
17, 000	68, 000	. 036367	. 004367	....	....	
17, 500	70, 000	. 041333	. 004966	....	....	
18, 000	72, 000	. 048667	. 007334	....	....	
18, 500	74, 000	. 056667	. 008000	....	....	
19, 000	76, 000	. 066667	. 010000	....	....	
19, 500	78, 000	. 081333	. 014666	....	....	
20, 000	80, 000	. 1167	. 035367	....	....	
20, 070	80, 280	. 1433	. 0266	....	....	Tensile strength.
18, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80, 280
Elastic limit per square inch of original section	do ...	40, 000
Elongation per inch after rupture	inch..	0. 2067
Elongation per inch under strain at elastic limit	do....	. 001267
Reduction in diameter at point of rupture	do....	. 124
Reduction in area after rupture, per centum of original section		39. 3
Position of rupture		″.8 from neck
Character of broken surface		granular; dull silky center
Elongation of inch sections		″.36*, ″.13, ″.13

No. 904.

Marks, $\substack{8\,T_{17}\\ M\,T_4\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongaton per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000400	.000100	0.		
5,000	20,000	.000600	.000200	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001100	.000167	0.		
9,000	36,000	.001167	.000067			
9,250	37,000	.001200	.000033			Elastic limit.
9,500	38,000	.002133	.000933			
9,750	39,000	.002600	.000467			
10,000	40,000	.004267	.001667	.002900	.002900	
10,250	41,000	.005733	.001466			
10,500	42,000	.006667	.000934			
10,750	43,000	.007500	.000833			
11,000	44,000	.008500	.001000			
11,250	45,000	.009800	.001300	.008233	.005333	
11,500	46,000	.010667	.000867			
11,750	47,000	.011333	.000666			
12,000	48,000	.012667	.001334			
12,250	49,000	.013933	.001266			
12,500	50,000	.015433	.001500	.013533	.005300	
12,750	51,000	.016033	.000600			
13,000	52,000	.017267	.001234			
13,250	53,000	.018333	.001066			
13,500	54,000	.020600	.002267			
13,750	55,000	.021700	.001100			
14,000	56,000	.023300	.001600			
14,250	57,000	.024967	.001667			
14,500	58,000	.026600	.001633			
14,750	59,000	.028167	.001567			
15,000	60,000	.033233	.005066			
15,500	62,000	.034167	.000934			
16,000	64,000	.038333	.004166			
16,500	66,000	.043333	.005000			
17,000	68,000	.050000	.006667			
17,500	70,000	.058000	.008000			
18,000	72,000	.068333	.010333			
18,500	74,000	.0900	.021667			
19,000	76,000	.1200	.0300			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	76,000
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		″.62 from neck
Character of broken surface		fine granular, radiating from a small blow-hole at circumference
Elongation of inch sections		″.16*, ″.10, ″.10

No. 859.

Marks, $\begin{smallmatrix}8\,T_{18}\\B\,T_{2}\,O\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000800	.000133	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	.000033	.000033	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000033	....	
10,250	41,000	.001300	0.	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	Elastic limit.
11,250	45,000	.001533	.000133	.000133	.000100	
11,500	46,000	.001733	.000200	....	....	
11,750	47,000	.001933	.000200	....	....	
12,000	48,000	.002600	.000667	....	....	
12,250	49,000	.003600	.001000	....	....	
12,500	50,000	.004400	.000800	.002633	.002500	
12,750	51,000	.005000	.000600	....	....	
13,000	52,000	.006233	.001233	....	....	
13 250	53,000	.007167	.000934	....	....	
13,500	54,000	.008737	.001570	....	....	
13,750	55,000	.009833	.001006	....	....	
14,000	56,000	.010967	.001134	....	....	
14,250	57,000	.011900	.000933	....	....	
14,500	58,000	.012833	.000933	....	....	
14,750	59,000	.014000	.001167	....	....	
15,000	60,000	.015167	.001167	....	....	
15,500	62,000	.017467	.002300	....	....	
16,000	64,000	.020167	.002700	....	....	
16,500	66,000	.023000	.002833	....	....	
17,000	68,000	.026000	.003000	....	....	
17,500	70,000	.030000	.004000	....	....	
18,000	72,000	.033667	.003667	....	....	
18,500	74,000	.038167	.004500	....	....	
19,000	76,000	.043333	.005166	....	....	
19,500	78,000	.050000	.006667	....	....	
20,000	80,000	.0573	.0073	....	....	
20,500	82,000	.0700	.0127	....	....	
21,000	84,000	.0900	.0200	....	....	
21,280	85,120	.1333	.0433	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85,120
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2033
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.9 from neck
Character of broken surface		silky, 70 per centum; granular, 30 per centum
Elongation of inch sections		″.33*, ″.18, ″.10

No. 860.

Marks, $\overset{8\,T_{16}}{B\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	Pounds.	Inch.	Inch.	Inch.	Inch.	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001233	.000066	....	....	
10,000	40,000	.001300	.000067	.000100	.000100	
10,250	41,000	.001367	.000067	....	....	Elastic limit.
10,500	42,000	.001600	.000233	....	....	
10,750	43,000	.002800	.001200	....	....	
11,000	44,000	.004200	.001400	....	....	
11,250	45,000	.005217	.001067	.003733	.003633	
11,500	46,000	.006000	.000733	....	....	
11,750	47,000	.006933	.000933	....	....	
12,000	48,000	.008133	.001200	....	....	
12,250	49,000	.009067	.000934	....	....	
12,500	50,000	.010233	.001166	.008433	.004700	
12,750	51,000	.010700	.000467	....	....	
13,000	52,000	.011733	.001033	....	....	
13,250	53,000	.012833	.001100	....	....	
13,500	54,000	.014333	.001500	....	....	
13,750	55,000	.015333	.001000	....	....	
14,000	56,000	.016667	.001334	....	....	
14,250	57,000	.017833	.001166	....	....	
14,500	58,000	.019567	.001734	....	....	
14,750	59,000	.020833	.001266	....	....	
15,000	60,000	.022333	.001500	....	....	
15,500	62,000	.024700	.002367	....	....	
16,000	64,000	.028067	.003367	....	....	
16,500	66,000	.031833	.003766	....	....	
17,000	68,000	.035667	.003834	....	....	
17,500	70,000	.040667	.005000	....	....	
18,000	72,000	.046667	.006000	....	....	
18,500	74,000	.054167	.007500	....	....	
19,000	76,000	.062833	.008666	....	....	
19,500	78,000	.076667	.013834	....	....	
20,000	80,000	.0933	.016633	....	....	
20,410	81,640	.1667	.0734	....	....	Tensile strength.
17,980	------------	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..pounds.. 81, 64
Elastic limit per square inch of original section..do.... 41, 00
Elongation per inch after rupture ....inch.. 0. 253
Elongation per inch under strain at elastic limit ....do.... .00136
Elongation per inch at point of rupture..do.... .14
Reduction in diameter after rupture, per centum of original section .... 44.
Reduction in area after rupture..″.9 from nec
Position of rupture..................silky, 60 per centum; granular, 40 per centum
Character of broken surface..″.38*, ″.23, ″.1
Elongation of inch sections

No. 861.

Marks, $^{8\,\mathrm{T}_{18}}_{\mathrm{M}\,\mathrm{T}_1\mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	.000033	.000033	
10,000	40,000	.001200	.000133	.000033	0.	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001300	.000067	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000067	.000034	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001433	0.	....	....	
12,000	48,000	.001500	.000067	....	....	
12,250	49,000	.001567	.000067	....	....	
12,500	50,000	.001633	.000066	.000067	0.	
12,750	51,000	.001700	.000067	....	....	Elastic limit.
13,000	52,000	.002000	.000300	....	....	
13,250	53,000	.002500	.000500	....	....	
13,500	54,000	.003333	.000833	....	....	
13,750	55,000	.004400	.001067	.002567	.002500	
14,000	56,000	.006167	.001767	....	....	
14,250	57,000	.007233	.001066	....	....	
14,500	58,000	.008600	.001367	....	....	
14,750	59,000	.009433	.000833	....	....	
15,000	60,000	.010400	.000967	....	....	
15,500	62,000	.012267	.001867	....	....	
16,000	64,000	.014667	.002400	....	....	
16,500	66,000	.016933	.002266	....	....	
17,000	68,000	.019433	.002500	....	....	
17,500	70,000	.022433	.003000	....	....	
18,000	72,000	.025333	.002900	....	....	
18,500	74,000	.028333	.003000	....	....	
19,000	76,000	.032000	.003667	....	....	
19,500	78,000	.036333	.004333	....	....	
20,000	80,000	.041167	.004834	....	....	
20,500	82,000	.046833	.005666	....	....	
21,000	84,000	.054667	.007834	....	....	
21,500	86,000	.064667	.010000	....	....	
22,000	88,000	.0867	.022033	....	....	
22,320	89,280	.1300	.0433	....	....	Tensile strength.
19,700	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8548
Hardness		14.98
Tensile strength per square inch of original section	pounds	89,280
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.2233
Elongation per inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.75 from middle of stem
Character of broken surface		silky, 60 per centum; granular, 40 per centum
Elongation of inch sections		″.29, ″.25, ″.13

No. 862.

Marks, $\overset{8\ T_{18}}{M\ T,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	0.		
6,250	25,000	.000833	.000166	0.		
7,500	30,000	.001000	.000167	0.		
8,750	35,000	.001167	.000167			
10,000	40,000	.001333	.000166	0.		
10,250	41,000	.001367	.000034			
10,500	42,000	.001400	.000033			
10,750	43,000	.001433	.000033			
11,000	44,000	.001467	.000034			
11,250	45,000	.001500	.000033	.000067	.000067	
11,500	46,000	.001533	.000033			
11,750	47,000	.001600	.000067			
12,000	48,000	.001700	.000100			
12,250	49,000	.001733	.000033			
12,500	50,000	.001800	.000067	.000133	.000066	
12,750	51,000	.001867	.000067			Elastic limit.
13,000	52,000	.002000	.000133			
13,250	53,000	.002367	.000367			
13,500	54,000	.003500	.001133			
13,750	55,000	.004400	.000900	.002500	.002367	
14,000	56,000	.005600	.001200			
14,250	57,000	.006333	.000733			
14,500	58,000	.007267	.000034			
14,750	59,000	.008533	.001266			
15,000	60,000	.009633	.001100	.007267	.004767	
15,500	62,000	.011033	.001400			
16,000	64,000	.013500	.002467			
16,500	66,000	.015833	.002333			
17,000	68,000	.018333	.002500			
17,500	70,000	.020500	.002167			
18,000	72,000	.023333	.002833			
18,500	74,000	.025667	.002334			
19,000	76,000	.028667	.003000			
19,500	78,000	.032000	.003333			
20,000	80,000	.037000	.005000			
20,500	82,000	.041333	.004333			
21,000	84,000	.046000	.004667			
21,500	86,000	.052333	.006333			
22,000	88,000	.0633	.010967			
22,500	90,000	.0733	.0100			
23,000	92,000	.1033	.0300			
23,050	92,200	.1367	.0334			Tensile strength.
19,900						Load at time of ruptur

General summary.

Tensile strength per square inch of original section ....pounds.. 9
Elastic limit per square inch of original section ....do ... 5
Elongation per inch after rupture ....inch.. 0
Elongation per inch under strain at elastic limit ....do.... .0
Reduction in diameter at point of rupture ....do....
Reduction in area after rupture, per centum of original section ....
Position of rupture..at middle of
Character of broken surface..silky, interspersed with granular
Elongation of inch sections..".15, ".37",

No. 863.

Marks, $\overset{8\ T_{12}}{M\ T_2\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000233	.000166	—.000033	0.	
3,750	15,000	.000367	.000134	—.000033	0.	
5,000	20,000	.000567	.000200	—.000033	0.	
6,250	25,000	.000733	.000166	—.000033	0.	
7,500	30,000	.000867	.000134	—.000033	0.	
8,750	35,000	.001033	.000166	—.000033	0.	
10,000	40,000	.001200	.000167	—.000033	0.	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001367	.000034	—.000033	0.	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001533	.000100	....	....	Elastic limit.
12,250	49,000	.001667	.000134	....	....	
12,500	50,000	.002067	.000400	.000467	.000500	
12,750	51,000	.002600	.000533	....	....	
13,000	52,000	.003733	.001133	....	....	
13,250	53,000	.004867	.001134	....	....	
13,500	54,000	.006167	.001300	....	....	
13,750	55,000	.007000	.000833	.005067	.004600	
14,000	56,000	.008033	.001033	....	....	
14,250	57,000	.008667	.000634	....	....	
14,500	58,000	.010000	.001333	....	....	
14,750	59,000	.010667	.000667	....	....	
15,000	60,000	.011800	.001133	.009633	.004566	
15,500	62,000	.013333	.001533	....	....	
16,000	64,000	.017000	.003667	....	....	
16,500	66,000	.019000	.002000	....	....	
17,000	68,000	.021333	.002333	....	....	
17,500	70,000	.024667	.003334	....	....	
18,000	72,000	.027667	.003000	....	....	
18,500	74,000	.030000	.002333	....	....	
19,000	76,000	.033333	.003333	....	....	
19,500	78,000	.037167	.003834	....	....	
20,000	80,000	.042500	.005333	....	....	
20,500	82,000	.049000	.006500	....	....	
21,000	84,000	.056333	.007333	....	....	
21,500	86,000	.066667	.010334	....	....	
22,000	88,000	.0833	.016633	....	....	
22,380	89,520	.1333	.0500	....	....	Tensile strength.
19,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	89,520
Elastic limit per square inch of original section	do ...	48,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".4 from middle of stem
Character of broken surface		silky, with traces of granular metal
Elongation of inch sections		".18, ".37*, ".13

TUBE No. 19.—8″ *Converted Rifle.*

No. 815.

Marks, $\frac{8\ T_{19}}{B\ T_1\ I}$

Diameter, ″.563.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	***Per square inch.***					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000400	.000133	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000700	.000133	0.		
7,500	30,000	.000933	.000233	.000033	.000033	
8,750	35,000	.001100	.000167	.000033	0.	
9,000	36,000	.001200	.000100			Elastic limit.
9,250	37,000	.001700	.000500			
9,500	38,000	.002367	.000667			
9,750	39,000	.003000	.000633			
10,000	40,000	.004267	.001267	.002967	.002934	
10,250	41,000	.004933	.000666			
10,500	42,000	.005900	.000967			
10,750	43,000	.006733	.000833			
11,000	44,000	.008100	.001367			
11,250	45,000	.009067	.000967	.007533	.004566	
11,500	46,000	.010067	.001000			
11,750	47,000	.011083	.000966			
12,000	48,000	.012333	.001300			
12,250	49,000	.013567	.001234			
12,500	50,000	.014800	.001233	.013033	.005500	
12,750	51,000	.015933	.001133			
13,000	52,000	.017333	.001400			
13,250	53,000	.018400	.001067			
13,500	54,000	.020267	.001867			
13,750	55,000	.021667	.001400			
14,000	56,000	.023733	.002066			
14,250	57,000	.025333	.001600			
14,500	58,000	.027000	.001667			
14,750	59,000	.028667	.001667			
15,000	60,000	.030700	.002033			
15,500	62,000	.035333	.004633			
16,000	64,000	.040167	.004834			
16,500	66,000	.046167	.006000			
17,000	68,000	.053333	.007166			
17,500	70,000	.061667	.008334			
18,000	72,600	.0733	.011633			
18,500	74,000	.1000	.0267			
18,620	74,480	.1333	.0333			Tensile strength.

General summary.

Specific gravity		7.8622
Hardness		11.39
Tensile strength per square inch of original section	pounds..	74,480
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.1532
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.093
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.75 from neck, oblique
Character of broken surface		dull silky
Elongation of inch sections		″.25*, ″.11, ″.10

No. 816.

Marks, $\overset{8\ T}{B\ T}$, O
Diameter, ″.562.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000667	.000167	.000033	.000033	
6,250	25,000	.000767	.000100	.000033	0.	
7,500	30,000	.000933	.000166	.000067	.000034	
8,750	35,000	.001100	.000167	.000067	0.	
9,000	36,000	.001200	.000100			
9,250	37,000	.001267	.000067			
9,500	38,000	.001300	.000033			
9,750	39,000	.001333	.000033			Elastic limit.
10,000	40,000	.002200	.000867	.000933	.000866	
10,250	41,000	.004133	.001933			
10,500	42,000	.005067	.000934			
10,750	43,000	.006300	.001233			
11,000	44,000	.007167	.000867			
11,250	45,000	.008167	.001000	.006600	.005667	
11,500	46,000	.009400	.001233			
11,750	47,000	.009867	.000467			
12,000	48,000	.011133	.001266			
12,250	49,000	.012267	.001134			
12,500	50,000	.013333	.001066	.011500	.004900	
12,750	51,000	.014067	.000734			
13,000	52,000	.015000	.000933			
13,250	53,000	.016600	.001600			
13,500	54,000	.018333	.001733			
13,750	55,000	.019333	.001000			
14,000	56,000	.020600	.001267			
14,250	57,000	.022000	.001400			
14,500	58,000	.023933	.001933			
14,750	59,000	.025333	.001400			
15,000	60,000	.027000	.001667			
15,500	62,000	.031000	.004000			
16,000	64,000	.034967	.003967			
16,500	66,000	.039567	.004600			
17,000	68,000	.045000	.005433			
17,500	70,000	.051667	.006667			
18,000	72,000	.060000	.008333			
18,500	74,000	.071667	.011667			
19,000	76,000	.0867	.015033			
19,500	78,000	.1233	.0366			
19,570	78,280	.1533	.0300			Tensile strength.
17,400						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,280
Elastic limit per square inch of original section	do ...	39,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.152
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.20 from neck
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.26, ″.11

No. 817.

Marks, $\substack{8\,T_{12}\\ B\,T_3\,\underline{M}}$

Diameter, ″.563.

Sectional area, 25 square. inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001132	.000233	.000133	.000133	Elastic limit.
9,000	36,000	.001433	.000300	....	....	
9,250	37,000	.001800	.000367	....	....	
9,500	38,000	.002467	.000667	....	....	
9,750	39,000	.003500	.001033	....	....	
10,000	40,000	.005067	.001567	.003733	.003600	
10,250	41,000	.005733	.000666	....	....	
10,500	42,000	.006667	.000934	....	....	
10,750	43,000	.007500	.000833	....	....	
11,000	44,000	.008733	.001233	....	....	
11,250	45,000	.009667	.000934	.008067	.004334	
11,500	46,000	.011667	.002000	....	....	
11,750	47,000	.012000	.000333	....	....	
12,000	48,000	.012900	.000900	....	....	
12,250	49,000	.014000	.001100	....	....	
12,500	50,000	.015567	.001567	.013700	.005633	
12,750	51,000	.016667	.001100	....	....	
13,000	52,000	.017733	.001066	....	....	
13,250	53,000	.019000	.001267	....	....	
13,500	54,000	.020667	.001667	....	....	
13,750	55,000	.022000	.001333	....	....	
14,000	56,000	.023700	.001700	....	....	
14,250	57,000	.025433	.001733	....	....	
14,500	58,000	.027333	.001900	....	....	
14,750	59,000	.029000	.001667	....	....	
15,000	60,000	.031167	.002167	....	....	
15,500	62,000	.035333	.004166	....	....	
16,000	64,000	.040667	.005334	....	....	
16,500	66,000	.048333	.007666	....	....	
17,000	68,000	.055000	.006667	....	....	
17,500	70,000	.064000	.009000	....	....	
17,600	70,400	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	70,400
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.0933
Elongation per inch under strain at elastic limit	do....	.001183
Reduction of diameter at point of rupture	do....	.063
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		″.25 from middle of stem
Character of broken surface		dull silky; lines of light-colored metal
Elongation of inch sections		″.05, ″.17*, ″.06

No. 818.

Marks, $\overset{8\ T_{19}}{M\ T_1\ I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000200	.000200	0.	....	
2, 500	10, 000	.000333	.000133	0.	....	
3, 750	15, 000	.000500	.000167	0.	....	
5, 000	20, 000	.000667	.000167	.000033	.000033	
6, 250	25, 000	.000809	.000133	.000033	0.	
7, 500	30, 000	.000967	.000167	.000067	.000034	
8, 750	35, 000	.001133	.000166	.000067	0.	
9, 000	36, 000	.001167	.000034	....	....	
9, 250	37, 000	.001200	.000033	....	....	
9, 500	38, 000	.001233	.000033	....	....	
9, 750	39, 000	.001267	.000034	....	....	
10, 000	40, 000	.001367	.000100	.000100	.000033	
10, 250	41, 000	.001433	.000066	....	....	Elastic limit.
10, 500	42, 000	.001600	.000167	....	....	
10, 750	43, 000	.001933	.000333	....	....	
11, 000	44, 000	.002567	.000634	....	....	
11, 250	45, 000	.003467	.000900	.002033	.001933	
11, 500	46, 000	.004700	.001233	....	....	
11, 750	47, 000	.005133	.000433	....	....	
12, 000	48, 000	.006000	.000867	....	....	
12, 250	49, 000	.006933	.000933	....	....	
12, 500	50, 000	.007933	.001000	.006133	.004100	
12, 750	51, 000	.008567	.000634	....	....	
13, 000	52, 000	.009567	.001000	....	....	
13, 250	53, 000	.010433	.000866	....	....	
13, 500	54, 000	.011667	.001234	....	....	
13, 750	55, 000	.012667	.001000	....	....	
14, 000	56, 000	.013667	.001000	....	....	
14, 250	57, 000	.014667	.001000	....	....	
14, 500	58, 000	.015967	.001300	....	....	
14, 750	59, 000	.017033	.001066	....	....	
15, 000	60, 000	.018400	.001367	....	....	
15, 500	62, 000	.021267	.002867	....	....	
16, 000	64, 000	.023733	.002466	....	....	
16, 500	66, 000	.026667	.002934	....	....	
17, 000	68, 000	.030100	.003433	....	....	
17, 500	70, 000	.034000	.003900	....	....	
18, 000	72, 000	.038133	.004133	....	....	
18, 500	74, 000	.043000	.004867	....	....	
19, 000	76, 000	.048333	.005333	....	....	
19, 500	78, 000	.056333	.008000	....	....	
20, 000	80, 000	.0633	.006967	....	....	
20, 500	82, 000	.0767	.0134	....	....	
21, 000	84, 000	.1033	.0266	....	....	
21, 220	84, 880	.1667	.0634	....	....	Tensile strength.
19, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8610
Hardness		14. 06
Tensile strength per square inch of original section	pounds	84, 880
Elastic limit per square inch of original section	do	41, 000
Elongation per inch after rupture	inch	0. 2067
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.103
Reduction in area after rupture, per centum of original section		33. 5
Position of rupture		″.6 from neck, oblique
Character of broken surface		dull silky; resembles the surface of a weld
Elongation of inch sections		″. 30*, ″. 15, ″. 17

No. 819.

Marks, $\substack{8\ T_{19} \\ M\ T_9O}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	**Per square inch.**					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	0.	....	
2,500	10,000	.000133	.000133	0.	....	
3,750	15,000	.000233	.000100	—.000033	—.000033	
5,000	20,000	.000433	.000200	—.000033	0.	
6,250	25,000	.000600	.000167	—.000033	0.	
7,500	30,000	.000767	.000167	—.000033	0.	
8,750	35,000	.000933	.000166	—.000033	0.	
9,000	36,000	.000967	.000034	....	....	
9,250	37,000	.001000	.000033	....	....	
9,500	38,000	.001033	.000033	....	....	
9,750	39,000	.001067	.000034	....	....	
10,000	40,000	.001067	0.	—.000033	0.	
10,250	41,000	.001133	.000066	....	....	
10,500	42,000	.001167	.000034	....	....	
10,750	43,000	.001200	.000033	....	....	
11,000	44,000	.001233	.000033	....	....	
11,250	45,000	.001300	.000067	.000033	.000067	Elastic limit.
11,500	46,000	.001767	.000467	....	....	
11,750	47,000	.002400	.000633	....	....	
12,000	48,000	.003500	.001100	....	....	
12,250	49,000	.004100	.000600	....	....	
12,500	50,000	.005300	.001200	.003600	.003567	
12,750	51,000	.005933	.000633	....	....	
13,000	52,000	.006767	.000834	....	....	
13,250	53,000	.007767	.001000	....	....	
13,500	54,000	.008733	.000966	....	....	
13,750	55,000	.009567	.000834	....	....	
14,000	56,000	.010700	.001133	....	....	
14,250	57,000	.011667	.000967	....	....	
14,500	58,000	.012833	.001166	....	....	
14,750	59,000	.013833	.001000	....	....	
15,000	60,000	.015000	.001167	....	....	
15,500	62,000	.017067	.002067	....	....	
16,000	64,000	.019933	.002866	....	....	
16,500	66,000	.022333	.002400	....	....	
17,000	68,000	.025000	.002667	....	....	
17,500	70,000	.028167	.003167	....	....	
18,000	72,000	.032267	.004100	....	....	
18,500	74,000	.036000	.003733	....	....	
19,000	76,000	.040500	.004500	....	....	
19,500	78,000	.045833	.005333	....	....	
20,000	80,000	.052167	.006334	....	....	
20,500	82,000	.061533	.009366	....	....	
21,000	84,000	.0800	.018467	....	....	
21,500	86,000	.1000	.0200	....	....	
21,690	86,760	.1333	.0333	....	....	Tensile strength.
20,200	....	....	....	....	....	Load at time of ruptur

General summary.

Tensile strength per square inch of original section..............................pounds.. 86
Elastic limit per square inch of original section..............................do.... 45
Elongation per inch after rupture..............................inch.. 0.
Elongation per inch under strain at elastic limit..............................do.... .00
Reduction in diameter at point of rupture..............................do....
Reduction in area after rupture, per centum of original section..............................
Position of rupture..............................″.25 from middle of s
Character of broken surface..............................granular; dull, silky spot at circumfere
Elongation of inch sections..............................″.11, ″.27*

No. 820.

Marks, $\overset{8\ T_{19}}{M\ T_{3}\ M}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001133	.000033	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001200	.000033	....	....	
10, 000	40, 000	.001233	.000033	0.	....	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001333	.000066	....	....	
10, 750	43, 000	.001400	.000067	....	....	Elastic limit.
11, 000	44, 000	.002067	.000667	....	....	
11, 250	45, 000	.003733	.001666	.002300	.002300	
11, 500	46, 000	.005167	.001434	....	....	
11, 750	47, 000	.005833	.000666	....	....	
12, 000	48, 000	.006600	.000767	....	....	
12, 250	49, 000	.007533	.000933	....	....	
12, 500	50, 000	.008667	.001134	.006867	.004567	
12, 750	51, 000	.009633	.000966	....	....	
13, 000	52, 000	.010333	.000700	....	....	
13, 250	53, 000	.011133	.000800	....	....	
13, 500	54, 000	.012500	.001367	....	....	
13, 750	55, 000	.013433	.000933	....	....	
14, 000	56, 000	.014733	.001300	....	....	
14, 250	57, 000	.015733	.001000	....	....	
14, 500	58, 000	.017267	.001534	....	....	
14, 750	59, 000	.018500	.001233	....	....	
15, 000	60, 000	.019833	.001333	....	....	
15, 500	62, 000	.022533	.002700	....	....	
16, 000	64, 000	.025667	.003134	....	....	
16, 500	66, 000	.028733	.003066	....	....	
17, 000	68, 000	.032833	.004100	....	....	
17, 500	70, 000	.038167	.005334	....	....	
18, 000	72, 000	.043500	.005333	....	....	
18, 500	74, 000	.049667	.006167	....	....	
19, 000	76, 000	.056667	.007000	....	....	
19, 500	78, 000	.0667	.010033	....	....	
20, 000	80, 000	.0800	.0133	....	....	
20, 500	82, 000	.1067	.0267	....	....	
20, 790	83, 160	.1500	.0433	....	....	Tensile strength.
18, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	83, 160
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 2133
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.133
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		".8 from neck
Character of broken surface		dull, silky, irregular surface; small spot of granular metal
Elongation of inch sections		".35*, ".16, ".13

TUBE No. 20.—8″ *Converted Rifle.*

No. 908.

Marks, $^{8\,T_8}_{B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000300	.000200	0.	....	
3, 750	15, 000	.000433	.000133	0.	....	
5, 000	20, 000	.000600	.000167	.000033	.000033	
6, 250	25, 000	.000767	.000167	.000067	.000034	
7, 500	30, 000	.000933	.000166	.000067	0.	
8, 750	35, 000	.001133	.000200	.000100	.000033	Elastic limit.
9, 000	36, 000	.001367	.000234	....	....	
9, 250	37, 000	.001833	.000466	....	....	
9, 500	38, 000	.002667	.000834	....	....	
9, 750	39, 000	.004367	.001700	....	....	
10, 000	40, 000	.005267	.000900	.003933	.003833	
10, 250	41, 000	.005933	.000666	....	....	
10, 500	42, 000	.007067	.001134	....	....	
10, 750	43, 000	.008033	.000966	....	....	
11, 000	44, 000	.009400	.001367	....	....	
11, 250	45, 000	.010433	.001033	.008767	.004834	
11, 500	46, 000	.011667	.001234	....	....	
11, 750	47, 000	.012900	.001233	....	....	
12, 000	48, 000	.013833	.000933	....	....	
12, 250	49, 000	.015333	.001500	....	....	
12, 500	50, 000	.017067	.001734	.015233	....	
12, 750	51, 000	.018133	.001066	....	....	
13, 000	52, 000	.019667	.001534	....	....	
13, 250	53, 000	.021000	.001333	....	....	
13, 500	54, 000	.022800	.001800	....	....	
13, 750	55, 000	.024567	.001767	....	....	
14, 000	56, 000	.026500	.001933	....	....	
14, 250	57, 000	.028400	.001900	....	....	
14, 500	58, 000	.030667	.002267	....	....	
14, 750	59, 000	.032667	.002000	....	....	
15, 000	60, 000	.035667	.003000	....	....	
15, 500	62, 000	.041200	.005533	....	....	
16, 000	64, 000	.047500	.006300	....	....	
16, 500	66, 000	.057667	.010167	....	....	
17, 000	68, 000	.068333	.010666	....	....	
17, 500	70, 000	.081667	.013334	....	....	
18, 000	72, 000	.1100	.028333	....	....	
18, 130	72, 520	.1433	.0333	....	....	Tensile strength.
15, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7. 8576
Hardness	11. 44
Tensile strength per square inch of original section...pounds..	72, 520
Elastic limit per square inch of original section...do....	35, 000
Elongation per inch after rupture...inch..	0. 2300
Elongation per inch under strain at elastic limit...do....	.001133
Reduction in diameter at point of rupture...do....	.174
Reduction in area after rupture, per centum of original section	52. 2
Position of rupture	″. 75 from middle of stem

Character of broken surface, silky, cracks developed in cylindrical surface of stem in vicinity of fracture.

Elongation of inch sections........″.25, ″.33*, ″.11

No. 909.

Marks, $\overset{8\ T_{30}}{B\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.		
2, 500	10, 000	. 000267	. 000134	0.		
3, 750	15, 000	. 000433	. 000166	0.		
5, 000	20, 000	. 000600	. 000167	0.		
6, 250	25, 000	. 000767	. 000167	0.		
7, 500	30, 000	. 000933	. 000166	0.		
8, 750	35, 000	. 001100	. 000167	0.		
9, 000	36, 000	. 001167	. 000067			
9, 250	37, 000	. 001233	. 000066			
9, 500	38, 000	. 001267	. 000034			Elastic limit.
9, 750	39, 000	. 001367	. 000100			
10, 000	40, 000	. 001467	. 000100	. 000233	. 000233	
10, 250	41, 000	. 002100	. 000633			
10, 500	42, 000	. 003067	. 000967			
10, 750	43, 000	. 004067	. 001000			
11, 000	44, 000	. 005433	. 001366			
11, 250	45, 000	. 006233	. 000800	. 004700	. 004467	
11, 500	46, 000	. 007633	. 001400			
11, 750	47, 000	. 008433	. 000800			
12, 000	48, 000	. 010067	. 001634			
12, 250	49, 000	. 010667	. 000600			
12, 500	50, 000	. 012033	. 001366	. 010200	. 005500	
12, 750	51, 000	. 012967	. 000934			
13, 000	52, 000	. 013833	. 000866			
13, 250	53, 000	. 015133	. 001300			
13, 500	54, 000	. 017167	. 002034			
13, 750	55, 000	. 018667	. 001500			
14, 000	56, 000	. 020000	. 001333			
14, 250	57, 000	. 021433	. 001433			
14, 500	58, 000	. 023000	. 001567			
14, 750	59, 000	. 024333	. 001333			
15, 000	60, 000	. 026033	. 001700			
15, 500	62, 000	. 030233	. 004200			
16, 000	64, 000	. 033733	. 003500			
16, 500	66, 000	. 038333	. 004600			
17, 000	68, 000	. 043733	. 005400			
17, 500	70, 000	. 050733	. 007000			
18, 000	72, 000	. 060000	. 009267			
18, 500	74, 000	. 072000	. 012000			
19, 000	76, 000	. 0967	. 0247			
19, 320	77, 280	. 1400	. 0433			Tensile strength.
16, 500						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77, 280
Elastic limit per square inch of original section	do....	38, 000
Elongation per inch after rupture	inch..	0. 2300
Elongation per inch under strain at elastic limit	do....	. 001267
Reduction in diameter at point of rupture	do....	. 164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		″.1 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.15, ″.42*, ″.12

No. 910.

Marks, $\overset{8\ T_{30}}{B\ T_{3}M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per suqare inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	.000033	.000033	
6,250	25,000	.000767	.000167	.000033	0.	
7,500	30,000	.000933	.000166	000067	.000034	
8,750	35,000	.001133	.000200	.000067	0.	
9,000	36,000	.001233	.000100	....	....	
9,250	37,000	.001267	.000034	....	....	Elastic limit.
9,500	38,000	.001500	.000233	....	....	
9,750	39,000	.001800	.000300	....	....	
10,000	40,000	.003567	.001767	.002267	.002200	
10,250	41,000	.004633	.001066	....	....	
10,500	42,000	.005500	.000867	....	....	
10,750	43,000	.006100	.000600	....	....	
11,000	44,000	.007767	.001667	....	....	
11,250	45,000	.008600	.000833	.007067	.004800	
11,500	46,000	.010167	.001567	....	....	
11,750	47,000	.010667	.000500	....	....	
12,000	48,000	.012333	.001666	....	....	
12,250	49,000	.013733	.001400	....	....	
12,500	50,000	.014833	.001100	.012900	.005833	
12,750	51,000	.016333	.001500	....	....	
13,000	52,000	.017833	.001500	....	....	
13,250	53,000	.018933	.001100	....	....	
13,500	54,000	.020667	.001734	....	....	
13,750	55,000	.022333	.001666	....	....	
14,000	56,000	.024000	.001067	....	....	
14,250	57,000	.025667	.001667	....	....	
14,500	58,000	.027500	.001833	....	....	
14,750	59,000	.029333	.001833	....	....	
15,000	60,000	.032000	.002667	....	....	
15,500	62,000	.036333	.004333	....	....	
16,000	64,000	.041167	.004834	....	....	
16,500	66,000	.047667	.006500	....	....	
17,000	68,000	.056333	.008666	....	....	
17,500	70,000	.066667	.010334	....	....	
18,000	72,000	.081000	.014333	....	....	
18,500	74,000	.1133	.0323	....	....	
18,750	75,000	.1700	.0567	....	....	Tensile strength.
16,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	**pounds..**	**75,000**
Elastic limit per square inch of original section	**do....**	**37,000**
Elongation per inch after rupture	**inch..**	**0.2667**
Elongation per inch under strain at elastic limit	**do....**	**.001267**
Reduction in diameter at point of rupture	**do....**	**.154**
Reduction in area after rupture, per centum of original section		**47.2**
Position of rupture		**″.37 from middle of stem**
Character of broken surface		**silky**
Elongation of inch sections		**″.21, ″.43*, ″.16**

No. 911.

Marks, $\overset{8\ T_{30}}{M\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001133	.000166	0.	....	
9,000	36,000	.001133	0.	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001300	.000067	0.	....	
10,250	41,000	.001367	.000067	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	Elastic limit.
11,250	45,000	.001767	.000300	.000233	.000233	
11,500	46,000	.002433	.000666	....	....	
11,750	47,000	.003400	.000967	....	....	
12,000	48,000	.005200	.001800	....	....	
12,250	49,000	.006067	.000867	....	....	
12,500	50,000	.007367	.001300	.005467	.005234	
12,750	51,000	.008267	.000900	....	....	
13,000	52,000	.009667	.001400	....	....	
13,250	53,000	.010600	.000933	....	....	
13,500	54,000	.011600	.001000	....	....	
13,750	55,000	.012700	.001100	....	....	
14,000	56,000	.013833	.001133	....	....	
14,250	57,000	.015133	.001300	....	....	
14,500	58,000	.016367	.001234	....	....	
14,750	59,000	.017600	.001233	....	....	
15,000	60,000	.019067	.001467	....	....	
15,500	62,000	.022033	.002966	....	....	
16,000	64,000	.024933	.002900	....	....	
16,500	66,000	.028667	.003734	....	....	
17,000	68,000	.032500	.003833	....	....	
17,500	70,000	.037500	.005000	....	....	
18,000	72,000	.043333	.005833	....	....	
18,500	74,000	.050000	.006667	....	....	
19,000	76,000	.057667	.007667	....	....	
19,500	78,000	.069667	.012000	....	....	
20,000	80,000	.086667	.017000	....	....	
20,340	81,360	.1500	.063333	....	....	Tensile strength.
18,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8559
Hardness		12.84
Tensile strength per square inch of original section	pounds	81,360
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.75 from middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		″.31*, ″.24 ″.17

No. 910.

Marks, $\overset{8\,T_{30}}{B\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per suqare inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000100	. 000100	0.	....	
2, 500	10, 000	. 000267	. 000167	0.	....	
3, 750	15, 000	. 000433	. 000166	0.	....	
5, 000	20, 000	.000600	. 000167	. 000033	. 000033	
6, 250	25, 000	. 000767	. 000167	. 000033	0.	
7, 500	30, 000	. 000933	. 000166	000067	. 000034	
8, 750	35, 000	. 001133	. 000200	. 000067	0.	
9, 000	36, 000	. 001233	. 000100	....	....	
9, 250	37, 000	. 001267	. 000034	....	....	Elastic limit.
9, 500	38, 000	. 001500	. 000233	....	....	
9, 750	39, 000	. 001800	. 000300	....	....	
10, 000	40, 000	. 003567	. 001767	. 002267	. 002200	
10, 250	41, 000	. 004633	. 001066	....	....	
10, 500	42, 000	. 005500	. 000867	....	....	
10, 750	43, 000	. 006100	. 000600	....	....	
11, 000	44, 000	. 007767	. 001667	....	....	
11, 250	45, 000	. 008600	. 000833	. 007067	. 004800	
11, 500	46, 000	. 010167	. 001567	....	....	
11, 750	47, 000	. 010667	. 000500	....	....	
12, 000	48, 000	. 012333	. 001666	....	....	
12, 250	49, 000	. 013733	. 001400	....	....	
12, 500	50, 000	. 014833	. 001100	. 012900	. 005833	
12, 750	51, 000	. 016333	. 001500	....	....	
13, 000	52, 000	. 017833	. 001500	....	....	
13, 250	53, 000	. 018933	. 061100	....	....	
13, 500	54, 000	. 020667	. 001734	....	....	
13, 750	55, 000	. 022333	. 001666	....	....	
14, 000	56, 000	. 024000	. 001067	....	....	
14, 250	57, 000	. 025667	. 001667	....	....	
14, 500	58, 000	. 027500	. 001833	....	....	
14, 750	59, 000	. 029333	. 001833	....	....	
15, 000	60, 000	. 032000	. 002667	....	....	
15, 500	62, 000	. 036333	.004333	....	....	
16, 000	64, 000	. 041167	. 004834	....	....	
16, 500	66, 000	. 047667	. 006500	....	....	
17, 000	68, 000	. 056333	.008666	....	....	
17, 500	70, 000	. 066667	. 010334	....	....	
18, 000	72, 000	. 081000	. 014333	....	....	
18, 500	74, 000	. 1133	. 0323	....	....	
18, 750	75, 000	. 1700	. 0567	....	....	Tensile strength.
16, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 75, 000
Elastic limit per square inch of original section ....do.... 37, 000
Elongation per inch after rupture..inch.. 0. 2667
Elongation per inch under strain at elastic limit ....do.... . 001267
Reduction in diameter at point of rupture...do.... . 154
Reduction in area after rupture, per centum of original section........................... 47. 2
Position of rupture .... ″.37 from middle of stem
Character of broken surface ....silky
Elongation of inch sections... ″.21, ″.43*, ″.16

No. 913.

Marks, $M\overset{8\,T_{20}}{T_{3}}M$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000467	.000100	0.	....	
6,250	25,000	.000667	.000200	0.	....	
7,500	30,000	.000867	.000200	0.	....	
8,750	35,000	.001033	.000166	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001267	.000100	.000067	.000067	
10,250	41,000	.001400	.000133	....	....	Elastic limit.
10,500	42,000	.002300	.000900	....	....	
10,750	43,000	.003500	.001200	....	....	
11,000	44,000	.004567	.001067	....	....	
11,250	45,000	.005500	.000933	.004033	.003966	
11,500	46,000	.006533	.001033	....	....	
11,750	47,000	.007167	.000634	....	....	
12,000	48,000	.008700	.001533	....	....	
12,250	49,000	.009933	.001233	....	....	
12,500	50,000	.011167	.001234	.009367	.005334	
12,750	51,000	.011733	.000566	....	....	
13,000	52,000	.012500	.000767	....	....	
13,250	53,000	.013600	.001100	....	....	
13,500	54,000	.015133	.001533	....	....	
13,750	55,000	.016333	.001200	....	....	
14,000	56,000	.017700	.001367	....	....	
14,250	57,000	.019033	.001333	....	....	
14,500	58,000	.020600	.001567	....	....	
14,750	59,000	.022000	.001400	....	....	
15,000	60,000	.023667	.001667	....	....	
15,500	62,000	.027000	.003333	....	....	
16,000	64,000	.031167	.004167	....	....	
16,500	66,000	.032333	.001166	....	....	
17,000	68,000	.040000	.007667	....	....	
17,500	70,000	.045667	.005667	....	....	
18,000	72,000	.053333	.007666	....	....	
18,500	74,000	.062167	.008834	....	....	
19,000	76,000	.074333	.012166	....	....	
19,500	78,000	.096667	.022334	....	....	
19,850	79,400	.1567	.060033	....	....	Tensile strength.
16,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,400
Elastic limit per square inch of original section	do...	41,000
Elongation per inch after rupture	inch..	0.2533
Elongation per inch under strain at elastic limit	do...	.001400
Reduction in diameter at point of rupture	do...	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.4 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.20, ″.39*, ″.17

TUBE No. 21.—8″ *Converted Rifle.*

No. 868.

Marks, $\overset{8\ T_{21}}{B\ T_1\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000067	.000067	
10,250	41,000	.001233	0.	....	....	
10,500	42,000	.001300	.000067	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001400	.000067	....	....	Elastic limit.
11,250	45,000	.001633	.000233	.000333	.000266	
11,500	46,000	.002167	.000534	....	....	
11,750	47,000	.003033	.000866	....	....	
12,000	48,000	.004833	.001800	....	....	
12,250	49,000	.006100	.001267	....	....	
12,500	50,000	.006967	.000867	.005267	.004934	
12,750	51,000	.007700	.000733	....	....	
13,000	52,000	.009000	.001300	....	....	
13,250	53,000	.010000	.001000	....	....	
13,500	54,000	.011367	.001367	....	....	
13,750	55,000	.012333	.000966	....	....	
14,000	56,000	.013767	.001434	....	....	
14,250	57,000	.015033	.001266	....	....	
14,500	58,000	.016300	.001267	....	....	
14,750	59,000	.017500	.001200	....	....	
15,000	60,000	.018933	.001433	....	....	
15,500	62,000	.021333	.002400	....	....	
16,000	64,000	.024500	.003167	....	....	
16,500	66,000	.028533	.004033	....	....	
17,000	68,000	.032000	.003467	....	....	
17,500	70,000	.036333	.004333	....	....	
18,000	72,000	.041433	.005100	....	....	
18,500	74,000	.047833	.006400	....	....	
19,000	76,000	.055500	.007667	....	....	
19,500	78,000	.069333	.013833	....	....	
20,000	80,000	.0933	.023967	....	....	
20,350	81,400	.1833	.0400	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8561
Hardness		13.08
Tensile strength per square inch of original section	pounds..	81,400
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.42*, ″.14, ″.12

No. 869.

Marks, $^{8\,T_{21}}_{B\,T_2\,O}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000133	.000066	—.000033	0.	
3,750	15,000	.000333	.000200	—.000033	0.	
5,000	20,000	.000500	.000167	—.000033	0.	
6,250	25,000	.000667	.000167	—.000033	0.	
7,500	30,000	.000833	.000166	—.000033	0.	
8,750	35,000	.001000	.000167	—.000033	0.	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001033	0.	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001133	.000033	—.000033	0.	
10,250	41,000	.001167	.000034	....	....	
10,500	42,000	.001233	.000066	....	....	Elastic limit.
10,750	43,000	.001400	.000167	....	....	
11,000	44,000	.002300	.000900	....	....	
11,250	45,000	.003400	.001100	.001967	.002000	
11,500	46,000	.004767	.001367	....	....	
11,750	47,000	.005600	.000833	....	....	
12,000	48,000	.006833	.001033	....	....	
12,250	49,000	.007833	.001200	....	....	
12,500	50,000	.009000	.001167	.007200	.005233	
12,750	51,000	.009700	.000700	....	....	
13,000	52,000	.010833	.001133	....	....	
13,250	53,000	.012000	.001167	....	....	
13,500	54,000	.013333	.001333	....	....	
13,750	55,000	.014333	.001000	....	....	
14,000	56,000	.015667	.001334	....	....	
14,250	57,000	.017000	.001333	....	....	
14,500	58,000	.018433	.001433	....	....	
14,750	59,000	.019500	.001067	....	....	
15,000	60,000	.021000	.001500	....	....	
15,500	62,000	.024333	.003333	....	....	
16,000	64,000	.027500	.003167	....	....	
16,500	66,000	.031500	.004000	....	....	
17,000	68,000	.035333	.003833	....	....	
17,500	70,000	.040233	.001900	....	....	
18,000	72,000	.048067	.007834	....	....	
18,500	74,000	.055500	.007433	....	....	
19,000	76,000	.067500	.012000	....	....	
19,500	78,000	.0833	.0158	....	....	
20,000	80,000	.1133	.0300	....	....	
20,040	80,160	.1400	.0267	....	....	Tensile strength,
15,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,160
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		″.9 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.43, ″.19, ″.10

No. 870.

Marks, $\overset{8\ T\ n}{B\ T,\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	.000033	.000033	
9,000	36,000	.001133	.000066	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001300	.000033	.000067	.000034	
10,250	41,000	.001367	.000067	....	....	Elastic limit.
10,500	42,000	.001567	.000200	....	....	
10,750	43,000	.002167	.000600	....	....	
11,000	44,000	.003333	.001166	....	....	
11,250	45,000	.004600	.001267	.003100	.003033	
11,500	46,000	.005733	.001133	....	....	
11,750	47,000	.006533	.000800	....	....	
12,000	48,000	.007500	.000967	....	....	
12,250	49,000	.008533	.001033	....	....	
12,500	50,000	.009667	.001134	.007800	.004700	
12,750	51,000	.010333	.000666	....	....	
13,000	52,000	.011500	.001167	....	....	
13,250	53,000	.012767	.001267	....	....	
13,500	54,000	.013767	.001000	....	....	
13,750	55,000	.015000	.001233	....	....	
14,000	46,000	.016500	.001500	....	....	
14,250	57,000	.017833	.001333	....	....	
14,500	58,000	.019500	.001667	....	....	
14,750	59,000	.020667	.001167	....	....	
15,000	60,000	.022167	.001567	....	....	
15,500	62,000	.025100	.002933	....	....	
16,000	64,000	.028500	.003400	....	....	
16,500	66,000	.032167	.003667	....	....	
17,000	68,000	.036667	.004500	....	....	
17,500	70,000	.041667	.005000	....	....	
18,000	72,000	.048000	.006333	....	....	
18,500	74,000	.056667	.008667	....	....	
19,000	76,000	.067500	.010833	....	....	
19,500	78,000	.0867	.0192	....	....	
20,000	80,000	.1400	.0533	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,000
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2467
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.2 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.18, ″.43*, ″.18

No. 871.

Marks, $\substack{8\,T_{21}\\ M\,T_{1}}$ I
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000900	.000133	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001300	.000233	.000033	.000033	
10,250	41,000	.001367	.000067	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001433	0.	....	....	
11,250	45,000	.001467	.000034	.000067	.000034	
11,500	46,000	001533	.000066	....	....	Elastic limit.
11,750	47,000	.001633	.000100	....	....	
12,000	48,000	.001867	.000234	....	....	
12,250	49,000	.002267	.000400	....	....	
12,500	50,000	.004433	.002166	.002600	.002533	
12,750	51,000	.004767	.000334	....	....	
13,000	52,000	.006000	.001233	....	....	
13,250	53,000	.007000	.001000	....	....	
13,500	54,000	.008300	.001300	....	....	
13,750	55,000	.009367	.001067	....	....	
14,000	56,000	.010400	.001033	....	....	
14,250	57,000	.011400	.001000	....	....	
14,500	58,000	.012500	.001100	....	....	
14,750	59,000	.013667	.001167	....	....	
15,000	60,000	.014933	.001266	....	....	
15,500	62,000	.017233	.002300	....	....	
16,000	64,000	.019833	.002600	....	....	
16,500	66,000	.022500	.002667	....	....	
17,000	68,000	.025667	.003167	....	....	
17,500	70,000	.028400	.002733	....	....	
18,000	72,000	.032500	.004100	....	....	
18,500	74,000	.037000	.004500	....	....	
19,000	76,000	.042000	.005000	....	....	
19,500	78,000	.047833	.005833	....	....	
20,000	80,000	.055667	.007834	....	....	
20,500	82,000	.0667	.011033	....	....	
21,000	84,000	.0767	.0100	....	....	
21,500	86,000	.1133	.0366	....	....	Tensile strength.
18,800	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8537
Hardness		14.26
Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	46,000
Elongation per inch after rupture	inch..	0.2033
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.9 from neck
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.15, ″.13

No. 871½.

Marks, $\overset{8}{M}\overset{T_{11}}{T_{3}}O$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000124	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000600	.000200	0.	....	
6, 250	25, 000	.000800	.000200	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001100	.000133	0.	....	
10, 000	40, 000	.001267	.000167	0.	....	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001300	0.	....	....	
10, 750	43, 000	.001367	.000067	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001467	.000067	.000100	.000100	Elastic limit.
11, 500	46, 000	.001800	.000333	....	....	
11, 750	47, 000	.002900	.001100	....	....	
12, 000	48, 000	.004833	.001933	....	....	
12, 250	49, 000	.006500	.001667	....	....	
12, 500	50, 000	.007800	.001300	.006100	.006000	
12, 750	51, 000	.008333	.000533	....	....	
13, 000	52, 000	.009067	.000734	....	....	
13, 250	53, 000	.010200	.001133	....	....	
13, 500	54, 000	.011333	.001133	....	....	
13, 750	55, 000	.012367	.001034	....	....	
14, 000	56, 000	.013733	.001366	....	....	
14, 250	57, 000	.014733	.001000	....	....	
14, 500	58, 000	.016367	.001633	....	....	
14, 750	59, 000	.017333	.000966	....	....	
15, 000	60, 000	.018933	.001600	....	....	
15, 500	62, 000	.021667	.002734	....	....	
16, 000	64, 000	.024667	.003000	....	....	
16, 500	66, 000	.027700	.003033	....	....	
17, 000	68, 000	.031500	.003800	....	....	
17, 500	70, 000	.035667	.004167	....	....	
18, 000	72, 000	.040667	.005000	....	....	
18, 500	74, 000	.046667	.006000	....	....	
19, 000	76, 000	.054000	.007333	....	....	
19, 500	78, 000	.062500	.008500	....	....	
20, 000	80, 000	.0767	.0142	....	....	
20, 500	82, 000	.1033	.0266	....	....	
20, 690	82, 760	.1367	.0334	....	....	Tensile strength.
16, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82, 760
Elastic limit per square inch of original section	do....	45, 000
Elongation per inch after rupture	inch..	0. 2300
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.18, ″.11

No. 872.

Marks, $\overset{8}{\mathrm{M}}\,\overset{\mathrm{T}_{21}}{\mathrm{T}_{3}}\,\mathrm{M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000267	.000134	0.		
3, 750	15, 000	.000400	.000133	0.		
5, 000	20, 000	.000600	.000200	0.		
6, 250	25, 000	.000767	.000167	0.		
7, 500	30, 000	.000933	.000166	0.		
8, 750	35, 000	.001067	.000134	0.		
10, 000	40, 000	.001233	.000166	0.		
10, 250	41, 000	.001267	.000034			
10, 500	42, 000	.001300	.000033			
10, 750	43, 000	.001367	.000067			Elastic limit.
11, 000	44. 000	.002000	.000633			
11, 250	45, 000	.002500	.000500	.001100	.001100	
11, 500	46, 000	.004467	.001967			
11, 750	47, 000	.005267	.000800			
12, 000	48, 000	.006500	.001233			
12, 250	49, 000	.007800	.001300			
12, 500	50, 000	.008800	.001000	.006900	.005800	
12, 750	51, 000	.009433	.000633			
13, 000	52, 000	.010333	.000900			
13, 250	53, 000	.011500	001167			
13, 500	54, 000	.013000	.001500			
13, 750	55, 000	.014000	.001000			
14, 000	56, 000	.015338	.001333			
14, 250	57, 000	.016333	.001000			
14, 500	58, 000	.017667	.001334			
14, 750	59, 000	.018933	.001266			
15, 000	60, 000	.020067	.001134			
15, 500	62, 000	.022800	.002733			
16, 000	64, 000	.025933	.003133			
16, 500	66, 000	.029000	.003067			
17, 000	68, 000	.032400	.003400			
17, 500	70, 000	.037000	.004600			
18, 000	72, 000	.041500	.004500			
18, 500	74, 000	.047333	.005833			
19, 000	76, 000	.054500	.007167			
19, 500	78, 000	.063667	.009167			
20, 000	80, 000	.0800	.016333			
20, 500	82, 000	.1067	.0267			
20, 650	82, 600	.1400	.0333			Tensile strength.
17, 500						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	82, 600
Elastic limit per square inch of original section	do	48, 000
Elongation per inch after rupture	inch	0. 2233
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		″. 9 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.15, ″.12

TUBE No. 22.—8″ *Converted Rifle.*

No. 873.

Marks, $\substack{8\ T\ n\\ B\ TI\ 1}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.	....	
2, 500	10, 000	. 000233	. 000100	0.	....	
3, 750	15, 000	. 000367	. 000134	0.	....	
5, 000	20, 000	. 000567	. 000200	0.	....	
6, 250	25, 000	. 000700	. 000133	0.	....	
7, 500	30, 000	. 000900	. 000200	0.	....	
8, 750	35, 000	. 001067	. 000167	0.	....	
9, 000	36, 000	. 001100	. 000033	....	....	
9, 250	37, 000	. 001133	. 000033	....	....	
9, 500	38, 000	. 001167	. 000034	....	....	Elastic limit.
9, 750	39, 000	. 001267	. 000100	....	....	
10, 000	40, 000	. 003967	. 002700	....	....	
10, 250	41, 000	. 005233	. 001266	....	....	
10, 500	42, 000	. 006300	. 001067	....	....	
10, 750	43, 000	. 007467	. 001167	....	....	
11, 000	44, 000	. 008833	. 001366	....	....	
11, 250	45, 000	. 009733	. 000900	. 008100	. 008100	
11, 500	46, 000	. 010567	. 000834	....	....	
11, 750	47, 000	. 011400	. 000833	....	....	
12, 000	48, 000	. 012700	. 001300	....	....	
12, 250	49, 000	. 014200	. 001500	....	....	
12, 500	50, 000	. 016067	. 001867	. 014033	. 005933	
12, 750	51, 000	. 017267	. 001200	....	....	
13, 000	52, 000	. 018733	. 001466	....	....	
13, 250	53, 000	. 020400	. 001667	....	....	
13, 500	54, 000	. 022033	. 001633	....	....	
13, 750	55, 000	. 023600	. 001567	....	....	
14, 000	56, 000	. 025500	. 001900	....	....	
14, 250	57, 000	. 027333	. 001833	....	....	
14, 500	58, 000	. 029167	. 001834	....	....	
14, 750	59, 000	. 031400	. 002233	....	....	
15, 000	60, 000	. 033933	. 002533	....	....	
15, 500	62, 000	. 035833	. 001900	....	....	
16, 000	64, 000	. 044167	. 008334	....	....	
16, 500	66, 000	. 051400	. 007233	....	....	
17, 000	68, 000	. 061000	. 009600	....	....	
17, 500	70, 000	. 0733	. 0123	....	....	
18, 000	72, 000	. 0933	. 0200	....	....	
18, 500	74, 000	. 1300	. 0367	....	....	
18, 660	74, 640	. 1733	. 0433	....	....	Tensile strength.
15, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8545
Hardness		11. 18
Tensile strength per square inch of original section	pounds..	74, 640
Elastic limit per square inch of original section	do....	38, 000
Elongation per inch after rupture	inch..	0. 2633
Elongation per inch under strain at elastic limit	do....	. 001167
Reduction in diameter at point of rupture	do....	. 153
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		at middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		″. 16, ″. 45*, ″. 18

No. 874.

Marks, $\genfrac{}{}{0pt}{}{8\ T_{zz}}{B\ T,\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.		
2, 500	10, 000	.000300	.000167	0.		
3, 750	15, 000	.000433	.000133	0.		
5, 000	20, 000	.000600	.000167	0.		
6, 250	25, 000	.000767	.000167	0.		
7, 500	30, 000	.000933	.000166	0.		
8, 750	35, 000	.001067	.000134			
9, 000	36, 000	.001133	.000066			
9, 250	37, 000	.001133	0.			
9, 500	38, 000	.001167	.000034			
9, 750	39, 000	.001200	.000033			Elastic limit.
10, 000	40, 000	.001300	.000100			
10, 250	41, 000	.001533	.000233			
10, 500	42, 000	.002967	.001434			
10, 750	43, 000	.004033	.001066			
11, 000	44, 000	.005400	.001367			
11, 250	45, 000	.006233	.000833	.004667	.004667	
11, 500	46, 000	.007133	.000900			
11, 750	47, 000	.008300	.001167			
12, 000	48, 000	.009633	.001333			
12, 250	49, 000	.010567	.000934			
12, 500	50, 000	.011800	.001233	.010000	.005333	
12, 750	51, 000	.012700	.000900			
13, 000	52, 000	.014000	.001300			
13, 250	53, 000	.015100	.001100			
13, 500	54, 000	.016667	.001567			
13, 750	55, 000	.017867	.001200			
14, 000	56, 000	.019333	.001466			
14, 250	57, 000	.020667	.001334			
14, 500	58, 000	.022333	.001666			
14, 750	59, 000	.024000	.001667			
15, 000	60, 000	.025833	.001833			
15, 500	62, 000	.029333	.003500			
16, 000	64, 000	.033533	.004200			
16, 500	66, 000	.038000	.004467			
17, 000	68, 000	.044000	.006000			
17, 500	70, 000	.050567	.006567			
18, 000	72, 000	.058333	.007766			
18, 500	74, 000	.069500	.011167			
19, 000	76, 000	.085667	.016167			
19, 500	78, 000	.1333	.047633			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	78, 000
Elastic limit, per square inch of original section	do....	39, 000
Elongation per inch after rupture	inch..	0. 2333
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		″.4 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.17, ″.41*, ″.12

No. 875.

Marks, $^{8\ T_8}_{B\ T_1\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
230	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000900	.000100	0.	....	
8,700	35,000	.001067	.000167	0.	....	
9,000	36,000	.001133	.000066	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001300	.000067	.000033	.000033	Elastic limit.
10,250	41,000	.001500	.000200	....	....	
10,500	42,000	.003333	.001833	....	....	
10,750	43,000	.005333	.002000	....	....	
11,000	44,000	.006567	.001234	....	....	
11,250	45,000	.007567	.001000	.005933	.005900	
11,500	46,000	.008300	.000733	....	....	
11,750	47,000	.009333	.001033	....	....	
12,000	48,000	.010267	.000934	....	....	
12,230	49,000	.011600	.001333	....	....	
12,500	50,000	.013000	.001400	.011133	.005200	
12,750	51,000	.013433	.000433	....	....	
13,000	52,000	.014767	.001334	....	....	
13,250	53,000	.015833	.001066	....	....	
13,500	54,000	.017800	.001967	....	....	
13,730	55,000	.019267	.001467	....	....	
14,000	56,000	.020733	.001466	....	....	
14,230	57,000	.022000	.001267	....	....	
14,500	58,000	.024000	.002000	....	....	
14,750	59,000	.025467	.001467	....	....	
15,000	60,000	.027000	.001533	....	....	
15,500	62,000	.029667	.002667	....	....	
16,000	64,000	.032000	.002333	....	....	
16,500	66,000	.035467	.003467	....	....	
17,000	68,000	.046667	.011200	....	....	
17,500	70,000	.053333	.006666	....	....	
18,000	72,000	.063167	.009834	....	....	
18,500	74,000	.077167	.014000	....	....	
19,000	76,000	.0900	.012833	....	....	
19,500	78,000	.1367	.0467	....	....	
19,520	78,080	.1633	.0266	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	78,080
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2233
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.62 from middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		″.83*, ″.21, ″.13

No. 876.

Marks, $^{S\ T_{28}}_{M\ T_1\ I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000033	0.	
6,250	25,000	.000833	.000166	.000067	.000034	
7,500	30,000	.000967	.000134	.000067	0.	
8,750	35,000	.001133	.000166	.000067	0.	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001300	.000067	....	....	Elastic limit.
10,000	40,000	.003533	.002233	.002233	.002166	
10,250	41,000	.004467	.000934	....	....	
10,500	42,000	.006200	.001733	....	....	
10,750	43,000	.006933	.000733	....	....	
11,000	44,000	.008467	.001534	....	....	
11,250	45,000	.009500	.001033	.007867	.005634	
11,500	46,000	.010400	.000900	....	....	
11,750	47,000	.011200	.000800	....	....	
12,000	48,000	.012833	.001633	....	....	
12,250	49,000	.014267	.001434	....	....	
12,500	50,000	.015267	.001000	.013333	....	
12,750	51,000	.016000	.000733	....	....	
13,000	52,000	.017533	.001533	....	....	
13,250	53,000	.018767	.001234	....	....	
13,500	54,000	.020400	.001633	....	....	
13,750	55,000	.022000	.001600	....	....	
14,000	56,000	.024133	.002133	....	....	
14,250	57,000	.025800	.001667	....	....	
14,500	58,000	.027467	.001667	....	....	
14,750	59,000	.029000	.001533	....	....	
15,000	60,000	.031167	.002167	....	....	
15,500	62,000	.035500	.004333	....	....	
16,000	64,000	.040667	.005167	....	....	
16,500	66,000	.047067	.006400	....	....	
17,000	68,000	.054000	.005933	....	....	
17,500	70,000	.063333	.009333	....	....	
18,000	72,000	.076333	.013000	....	....	
18,500	74,000	.095000	.018667	....	....	
18,810	75,240	.1467	.0517	....	....	Tensile strength.

General summary.

Specific gravity		7.8562
Hardness		11.75
Tensile strength per square inch of original section	pounds	75,240
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.2238
Elongation per inch under strain at elastic limit	do	.001300
Reduction in diameter at point of rupture	do	.193
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		at middle of stem
Character of broken surface		fine silky
Elongation of inch sections		″.13, ″.43*, .11

No. 877.

Marks, $\overset{\text{8 T}_{3}}{\text{M T}}$, O
Diameter,″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	—.000033	
2,500	10,000	.000200	.000133	—.000033	0.	
3,750	15,000	.000300	.000100	—.000033	0.	
5,000	20,000	.000467	.000167	....	....	
6,250	25,000	.000633	.000166	....	....	
7,500	30,000	.000800	.000167	....	....	
8,750	35,000	.000967	.000167	—.000033	0.	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	Elastic limit.
10,000	40,000	.002333	.001233	.001033	.001066	
10,250	41,000	.002900	.000567	....	....	
10,500	42,000	.005333	.002433	....	....	
10,750	43,000	.007500	.002167	....	....	
11,000	44,000	.008167	.000667	....	....	
11,250	45,000	.009200	.001033	.007500	.006467	
11,500	46,000	.010333	.001133	....	....	
11,750	47,000	.011700	.001367	....	....	
12,000	48,000	.013100	.001400	....	....	
12,250	49,000	.013900	.000800	....	....	
12,500	50,000	.015233	.001333	.013300	.005800	
12,750	51,000	.016333	.001100	....	....	
13,000	52,000	.017667	.001534	....	....	
13,250	53,000	.019333	.001466	....	....	
13,500	54,000	.020833	.001500	....	....	
13,750	55,000	.022333	.001500	....	....	
14,000	56,000	.024333	.002000	....	....	
14,250	57,000	.026000	.001667	....	....	
14,500	58,000	.027533	.001583	....	....	
14,750	59,000	.029667	.002134	....	....	
15,000	60,000	.031900	.002233	....	....	
15,500	62,000	.037000	.005100	....	....	
16,000	64,000	.041667	.004667	....	....	
16,500	66,000	.048667	.007000	....	....	
17,000	68,000	.055667	.007000	....	....	
17,500	70,000	.066667	.011000	....	....	
18,000	72,000	.079333	.012666	....	....	
18,500	74,000	.1000	.020667	....	....	
18,840	75,360	.1600	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	75,360
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.2467
Elongation per inch under strain at elastic limit	do	.001100
Reduction in diameter at point of rupture	do	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		″75 from middle of stem oblique
Character of broken surface		silky
Elongation of inch sections		″.32*, ″.27, ″.15

No. 878.

Marks, $^{8\,T_{38}}_{M\,T_3\,M}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	...	
2,500	10,000	.000333	.000166	0.	...	
3,750	15,000	.000500	.000167	0.	...	
5,000	20,000	.000667	.000167	0.	...	
6,250	25,000	.000833	.000166	.000033	.000033	
7,500	30,000	.001000	.000167	.000033	0.	
8,750	35,000	.001167	.000167	.000033	0.	
9,000	36,000	.001200	.000033	...	...	
9,250	37,000	.001233	.000033	...	...	Elastic limit.
9,500	38,000	.002300	.001067	...	...	
9,750	39,000	.003133	.000833	...	...	
10,000	40,000	.004267	.001134	.002900	.002867	
10,250	41,000	.007667	.003400	...	...	
10,500	42,000	.009000	.001333	...	...	
10,750	43,000	.009800	.000800	...	...	
11,000	44,000	.010533	.000733	...	...	
11,250	45,000	.011533	.001000	.009900	.007000	
11,500	46,000	.013000	.001467	...	...	
11,750	47,000	.014067	.001067	...	...	
12,000	48,000	.015600	.001533	...	...	
12,250	49,000	.016933	.001333	...	...	
12,500	50,000	.018500	.001567	.016500	.006600	
12,750	51,000	.019200	.000700	...	...	
13,000	52,000	.020867	.001667	...	...	
13,250	53,000	.022667	.001800	...	...	
13,500	54,000	.024400	.001733	...	...	
13,750	55,000	.026333	.001933	...	...	
14,000	56,000	.028333	.002000	...	...	
14,250	57,000	.030333	.002000	...	...	
14,500	58,000	.032267	.001934	...	...	
14,750	59,000	.034667	.002400	...	...	
15,000	60,000	.037067	.002400	...	...	
15,500	62,000	.043667	.006600	...	...	
16,000	64,000	.049667	.006000	...	...	
16,500	66,000	.057500	.007833	...	...	
17,000	68,000	.067000	.009500	...	...	
17,500	70,000	.080667	.013667	...	...	
18,000	72,000	.1033	.022633	...	...	
18,280	73,120	.1533	.0500	...	...	Tensile strength.
14,500	...	...	...	...	...	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	73,120
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.213
Reduction in area after rupture, per centum of original section		61.5
Position of rupture		″.6 from neck
Character of broken surface		fine, silky
Elongation of inch sections		″.47*, ″.14, ″.11

TUBE No. 23.—8″ *Converted Rifle.*

No. 920.

Marks, $\substack{8\,T_8 \\ B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000600	.000133	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001367	.000100	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	Elastic limit.
11,250	45,000	.002567	.001100	.001067	.001067.	
11,500	46,000	.004267	.001700	....	....	
11,750	47,000	.005500	.001233	....	....	
12,000	48,000	.006767	.001267	....	....	
12,250	49,000	.007900	.001133	....	....	
12,500	50,000	.009267	.001367	.007400	.006333	
12,750	51,000	.010067	.000800	....	....	
13,000	52,000	.011133	.000066	....	....	
13,250	53,000	.012300	.001167	....	....	
13,500	54,000	.014033	.001733	....	....	
13,750	55,000	.015000	.000967	....	....	
14,000	56,000	.016600	.001600	....	....	
14,250	57,000	.017833	.001233	....	....	
14,500	58,000	.019367	.001534	....	....	
14,750	59,000	.020833	.001466	....	....	
15,000	60,000	.022833	.002000	....	....	
15,500	62,000	.027333	.004500	....	....	
16,000	64,000	.030400	.003067	....	....	
16,500	66,000	.035667	.005267	....	....	
17,000	68,000	.040833	.005166	....	....	
17,500	70,000	.046667	.005834	....	....	
18,000	72,000	.056000	.009333	....	....	
18,500	74,000	.0667	.0107	....	....	
19,000	76,000	.0833	.0166	....	....	
19,500	78,000	.1233	.0400	....	....	
19,540	78,160	.1467	.0234	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8541
Hardness		9.20
Tensile strength per square inch of original section	pounds..	78,160
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2300
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.15, ″.14

No. 921.

Marks, $\frac{8\,T\,{}^{22}}{B\,T_{2},\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	**Initial load.**
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	0.	....	
10, 250	41, 000	.001333	.000066	....	....	**Elastic limit.**
10, 500	42, 000	.001533	.000200	....	....	
10, 750	43, 000	.005733	.004200	....	....	
11, 000	44, 000	.007133	.001400	....	....	
11, 250	45, 000	.007900	.000767	.006233	.006233	
11, 500	46, 000	009167	.001267	....	....	
11, 750	47, 000	.009633	.000466	....	....	
12, 000	48, 000	.010600	.000967	....	....	
12, 250	49, 000	.012300	.001700	....	....	
12, 500	50, 000	.013600	.001300	.011633	.005400	
12, 750	51, 000	.013933	.000333	....	....	
13, 000	52, 000	.014967	.001034	....	....	
13, 250	53, 000	.016167	.001200	....	....	
13, 500	54, 000	.018033	.001866	....	....	
13, 750	55, 000	.019000	.000967	....	....	
14, 000	56, 000	.020833	.001833	....	....	
14, 250	57, 000	.022333	.001500	....	....	
14, 500	58, 000	.023433	.001100	....	....	
14, 750	59, 000	.025000	.001567	....	....	
15, 000	60, 000	.026700	.001700	....	....	
15, 500	62, 000	.030500	.003800	....	....	
16, 000	64, 000	.034667	.004167	....	....	
16, 500	66, 000	.039833	.005166	....	....	
17, 000	68, 000	.045200	.005367	....	....	
17, 500	70, 000	.054667	.009467	....	....	
18, 000	72, 000	.062500	.007833	....	....	
18, 500	74, 000	.075500	.013000	....	....	
19, 000	76, 000	.1000	.0245	....	....	
19, 360	77, 440	.1633	.0633	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section........pounds.. 77, 440
Elastic limit per square inch of original section........do.... 41, 000
Elongation per inch after rupture........inch.. 0. 2033
Elongation per inch under strain at elastic limit........do.... .001833
Reduction in diameter at time of rupture........do.... .084
Reduction in area after rupture, per centum of original section........ 27. 6
Position of rupture........".75 from neck
Character of broken surface, granular, radiating from a small hole at the circumference, which was developed near the close of the test.
Elongation of inch sections........".23, ".21, ".17

TUBE No. 23.—8″ *Converted Rifle.*

No. 920.

Marks, $\overset{8\ \mathrm{Ts}}{\mathrm{B\ T_1\ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000467	.000200	0.		
5,000	20,000	.000600	.000133	0.		
6,250	25,000	.000767	.000107	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001100	.000167	0.		
9,000	36,000	.001133	.000033			
9,250	37,000	.001167	.000034			
9,500	38,000	.001200	.000033			
9,750	39,000	.001233	.000033			
10,000	40,000	.001267	.000034	0.		
10,250	41,000	.001367	.000100			
10,500	42,000	.001400	.000033			
10,750	43,000	.001433	.000033			
11,000	44,000	.001467	.000034			Elastic limit.
11,250	45,000	.002567	.001100	.001067	.001067.	
11,500	46,000	.004267	.001700			
11,750	47,000	.005500	.001233			
12,000	48,000	.006767	.001267			
12,250	49,000	.007900	.001133			
12,500	50,000	.009267	.001367	.007400	.006333	
12,750	51,000	.010067	.000800			
13,000	52,000	.011133	.000066			
13,250	53,000	.012300	.001167			
13,500	54,000	.014033	.001733			
13,750	55,000	.015000	.000967			
14,000	56,000	.016600	.001600			
14,250	57,000	.017833	.001233			
14,500	58,000	.019367	.001534			
14,750	59,000	.020833	.001466			
15,000	60,000	.022833	.002000			
15,500	62,000	.027333	.004500			
16,000	64,000	.030400	.003067			
16,500	66,000	.035667	.005267			
17,000	68,000	.040833	.005166			
17,500	70,000	.046667	.005834			
18,000	72,000	.056000	.009333			
18,500	74,000	.0667	.0107			
19,000	76,000	.0833	.0166			
19,500	78,000	.1233	.0400			
19,540	78,160	.1467	.0234			Tensile strength.
16,400						Load at time of rupture.

General summary.

Specific gravity		7.8541
Hardness		9.20
Tensile strength per square inch of original section	pounds	78,160
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.15, ″.14

No. 923.

Marks, $\overset{8\,T_{28}}{M\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001067	.000134	0.	....	
9,000	36,000	.001067	0.	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001200	.000067	....	....	
10,000	40,000	.001233	.000033	.000033	.000033	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001400	.000067	....	....	
11,250	45,000	.001433	.000033	.000100	.000067	Elastic limit
11,500	46,000	.001733	.000300	....	....	
11,750	47,000	.002600	.000867	....	....	
12,000	48,000	.003733	.001133	....	....	
12,250	49,000	.005067	.001334	....	....	
12,500	50,000	.006500	.001433	.004800	.004700	
12,750	51,000	.007700	.001200	....	....	
13,000	52,000	.008600	.000900	....	....	
13,250	53,000	.009767	.001167	....	....	
13,500	54,000	.011000	.001233	....	....	
13,750	55,000	.012167	.001167	....	....	
14,000	56,000	.013333	.001166	....	....	
14,250	57,000	.014367	.001034	....	....	
14,500	58,000	.015767	.001400	....	....	
14,750	59,000	.017067	.001300	....	....	
15,000	60,000	.018500	.001433	....	....	
15,500	62,000	.021200	.002700	....	....	
16,000	64,000	.023733	.002533	....	....	
16,500	66,000	.027067	.003334	....	....	
17,000	68,000	.031500	.004433	....	....	
17,500	70,000	.035833	.004333	....	....	
18,000	72,000	.040400	.004567	....	....	
18,500	74,000	.047600	.007200	....	....	
19,000	76,000	.056833	.011233	....	....	
19,500	78,000	.068333	.011500	....	....	
20,000	80,000	.0833	.014967	....	....	
20,500	82,000	.1300	.0467	....	....	Tensile strength.
18,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8511
Hardness		11.70
Tensile strength per square inch of original section	pounds..	82,000
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.5 from neck
Character of broken surface		granular, with dull silky spot
Elongation of inch sections		″.84*, ″.12, ″.13

No. 924.

Marks, $\overset{8\ Tn}{M\ T_2\ O}$
Diameter, ''.564.
***Sectional* area**, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	.000033	.000033	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000033	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.001567	.000167	....	....	
11,250	45,000	.003767	.002200	.002267	.002234	
11,500	46,000	.005500	.001733	....	....	
11,750	47,000	.006233	.000733	....	....	
12,000	48,000	.007400	.001167	....	....	
12,250	49,000	.008700	.001300	....	....	
12,500	50,000	.009767	.001067	.007900	.005633	
12,750	51,000	.010467	.000700	....	....	
13,000	52,000	.011533	.001066	....	....	
13,250	53,000	.012733	.001200	....	....	
13,500	54,000	.014033	.001300	....	....	
13,750	55,000	.015067	.001034	....	....	
14,000	56,000	.016500	.001433	....	....	
14,250	57,000	.017533	.001033	....	....	
14,500	58,000	.018900	.001367	....	....	
14,750	59,000	.020000	.001100	....	....	
15,000	60,000	.021533	.001533	....	....	
15,500	62,000	.025333	.003800	....	....	
16,000	64,000	.028000	.002667	....	....	
16,500	66,000	.032500	.004500	....	....	
17,000	68,000	.037333	.004833	....	....	
17,500	70,000	.040833	.003500	....	....	
18,000	72,000	.048000	.007167	....	....	
18,500	74,000	.056500	.008500	....	....	
19,000	76,000	.0667	.0102	....	....	
19,500	78,000	.0833	.0166	....	....	
20,000	80,000	.1233	.0400	....	....	
20,110	80,440	.1567	.0334	....	....	Tensile strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,440
Elastic limit per square inch of original section	do ...	43,000
Elongation per inch after rupture	inch..	0 2500
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		''.9 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		''.40*, ''.19, ''.16

No. 925.

Marks, $\overset{S\ T_{28}}{M\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001233	0.	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.001533	.000133	....	....	
11,250	45,000	.001700	.000167	.000233	.000233	
11,500	46,000	.002567	.000867	....	....	
11,750	47,000	.003333	.000766	....	....	
12,000	48,000	.004867	.001534	....	....	
12,250	49,000	.005733	.000866	....	....	
12,500	50,000	.006900	.001167	.005167	.004934	
12,750	51,000	.007667	.000767	....	....	
13,000	52,000	.008733	.001066	....	....	
13,250	53,000	.009667	.000934	....	....	
13,500	54,000	.011033	.001366	....	....	
13,750	55,000	.012167	.001134	....	....	
14,000	56,000	.013167	.001000	....	....	
14,250	57,000	.013933	.000766	....	....	
14,500	58,000	.015600	.001667	....	....	
14,750	59,000	.016700	.001100	....	....	
15,000	60,000	.018067	.001367	....	....	
15,500	62,000	.021000	.002933	....	....	
16,000	64,000	.023733	.002733	....	....	
16,500	66,000	.028000	.004267	....	....	
17,000	68,000	.031333	.003333	....	....	
17,500	70,000	.035033	.003700	....	....	
18,000	72,000	.040667	.005634	....	....	
18,500	74,000	.046367	.005700	....	....	
19,000	76,000	.053333	.006966	....	....	
19,500	78,000	.063333	.010000	....	....	
20,000	80,000	.0767	.013367	....	....	
20,500	82,000	.1067	.0300	....	....	
20,720	82,880	.1600	.0533	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	82,880
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2467
Elongation per inch under strain at elastic limit	do ...	.001400
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.75 from middle of stem
Character of broken surface		silky; 30 per cent. of fractured surface interspersed with granular metal
Elongation of inch sections		″.37*, ″.21, ″.16

TUBE No. 24.—8″ *Converted Rifle.*

No. 885½.

Marks, $^{8\ T\ N}_{B\ T_{1}I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation, per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000467	.000200	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000767	.000134	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	.000100	.000100	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	Elastic limit.
11, 250	43, 000	.008633	.007233	.006933	.006833	
11, 500	46, 000	.009533	.000900	....	....	
11, 750	47, 000	.009700	.000167	....	....	
12, 000	48, 000	.010833	.001133	....	....	
12, 250	49, 000	.012167	.001334	....	....	
12, 500	50, 000	.013667	.001500	.011833	.004900	
12, 750	51, 000	.014500	.000833	....	....	
13, 000	52, 000	.015467	.000967	....	....	
13, 250	53, 000	.016767	.001300	....	....	
13, 500	54, 000	.018500	.001733	....	....	
13, 750	55, 000	.019667	.001167	....	....	
14, 000	56, 000	.021667	.002200	....	....	
14, 250	57, 000	.023000	.001333	....	....	
14, 500	58, 000	.025000	.002000	....	....	
14, 750	59, 000	.026667	.001667	....	....	
15, 000	60, 000	.028500	.001833	....	....	
15, 500	62, 000	.032667	.004167	....	....	
16, 000	64, 000	.036667	.004000	....	....	
16, 500	66, 000	.042500	.005833	....	....	
17, 000	68, 000	.049333	.006833	....	....	
17, 500	70, 000	.056667	.007334	....	....	
18, 000	72, 000	.066000	.009333	....	....	
18, 500	74, 000	.080667	.014667	....	....	
19, 000	76, 000	.1067	.026033	....	....	
19, 200	76, 800	.1667	.0600	....	....	Tensile strength.
15, 300	- - - - - - - -	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 863
Hardness		11. 8
Tensile strength per square inch of original section	pounds..	76, 80
Elastic limit per square inch of original section	do....	44, 00
Elongation per inch after rupture	inch..	0. 260
Elongation per inch under strain at elastic limit	do...	.0014
Reduction in diameter at point of rupture	do...	.20
Reduction in area after rupture, per centum of original section		59.
Position of rupture		″.9 from nec
Character of broken surface		silky
Elongation of inch sections		″.45*, ″.18, ″.1

No. 886.

Marks, $\substack{8\,T_{34} \\ B\,T_{2}\,O}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	.000033	.000033	
6,250	25,000	.000800	.000167	.000033	0.	
7,500	30,000	.000967	.000167	.000067	.000034	
8,750	35,000	.001100	.000133	.000067	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001200	.000067	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000067	0.	
10,250	41,000	.001400	.000100	....	....	Elastic limit.
10,500	42,000	.001600	.000200	....	....	
10,750	43,000	.001733	.000133	....	....	
11,000	44,000	.002533	.000800	....	....	
11,250	45,000	.003367	.000834	.001767	.001700	
11,500	46,000	.004500	.001133	....	....	
11,750	47,000	.005667	.001167	....	....	
12,000	48,000	.006833	.001166	....	....	
12,250	49,000	.007733	.000900	....	....	
12,500	50,000	.008933	.001200	.007100	.005333	
12,750	51,000	.009233	.000300	....	....	
13,000	52,000	.009667	.000434	....	....	
13,250	53,000	.010667	.001000	....	....	
13,500	54,000	.011600	.000933	....	....	
13,750	55,000	.013333	.001733	....	....	
14,000	56,000	.014333	.001000	....	....	
14,250	57,000	.017067	.002734	....	....	
14,500	58,000	.018500	.001433	....	....	
14,750	59,000	.019733	.001233	....	....	
15,000	60,000	.021133	.001400	....	....	
15,500	62,000	.024667	.003534	....	....	
16,000	64,000	.027000	.002333	....	....	
16,500	66,000	.030333	.003333	....	....	
17,000	68,000	.034733	.004400	....	....	
17,500	70,000	.043000	.008267	....	....	
18,000	72,000	.046000	.003000	....	....	
18,500	74,000	.049667	.003667	....	....	
19,000	76,000	.061667	.012000	....	....	
19,500	78,000	.078333	.016666	....	....	
20,000	80,000	.1133	.034967	....	....	
20,120	80,480	.1600	.0467	....	....	Tensile strength.
16,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,480
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2667
Elongation per inch under strain of elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.173
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.9 from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ″.18, ″.13

TUBE No. 24.—8″ *Converted Rifle.*

No. 885½.

Marks, $^{8\ T\ 24}_{B\ T_1 I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation, per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000467	.000200	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000083	....	....	
10,000	40,000	.001267	.000034	.000100	.000100	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001338	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	Elastic limit.
11,250	45,000	.008633	.007233	.006933	.006833	
11,500	46,000	.009533	.000900	....	....	
11,750	47,000	.009700	.000167	....	....	
12,000	48,000	.010833	.001133	....	....	
12,250	49,000	.012167	.001334	....	....	
12,500	50,000	.013667	.001500	.011833	.004900	
12,750	51,000	.014500	.000833	....	....	
13,000	52,000	.015467	.000967	....	....	
13,250	53,000	.016767	.001300	....	....	
13,500	54,000	.018500	.001733	....	....	
13,750	55,000	.019667	.001167	....	....	
14,000	56,000	.021667	.002200	....	....	
14,250	57,000	.023000	.001133	....	....	
14,500	58,000	.025000	.002000	....	....	
14,750	59,000	.026667	.001667	....	....	
15,000	60,000	.028500	.001833	....	....	
15,500	62,000	.032667	.004167	....	....	
16,000	64,000	.036667	.004000	....	....	
16,500	66,000	.042500	.005833	....	....	
17,000	68,000	.049333	.006833	....	....	
17,500	70,000	.056667	.007334	....	....	
18,000	72,000	.066000	.009333	....	....	
18,500	74,000	.080667	.014667	....	....	
19,000	76,000	.1067	.026033	....	....	
19,200	76,800	.1667	.0600	....	....	Tensile strength.
15,300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8632
Hardness		11.81
Tensile strength per square inch of original section	pounds	76,800
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2600
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.204
Reduction in area after rupture, per centum of original section		59.8
Position of rupture		″.9 from neck
Character of broken surface		silky
Elongation of inch sections		″.45*, ″.18, ″.15

No. 888.

Marks, $\overset{8\,\mathrm{T}_{24}}{\mathrm{M\,T}_1\,\mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	.000067	.000067	
2,500	10,000	.000367	.000134	.000067	0.	
3,750	15,000	.000500	.000133	.000067	0.	
5,000	20,000	.000700	.000200	.000067	0.	
6,250	25,000	.000867	.000167	.000067	0.	
7,500	30,000	.001033	.000166	.000067	0.	
8,750	35,000	.001200	.000167	.000067	0.	
9,000	36,000	.001233	.000033	....	....	
9,250	37,000	.001267	.000034	....	....	
9,500	38,000	.001300	.000033	....	....	
9,750	39,060	.001333	.000033	....	....	
10,000	40,000	.001367	.000034	.000100	.000033	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	.000133	.000033	Elastic limit.
11,500	46,000	.001633	.000100	....	....	
11,750	47,000	.001767	.000134	....	....	
12,000	48,000	.002200	.000433	....	....	
12,250	49,000	.002400	.000200	....	....	
12,500	50,000	.003467	.001067	.001833	.001700	
12,750	51,000	.004267	.000800	....	....	
13,000	52,000	.005467	.001200	....	....	
13,250	53,000	.006467	.001000	....	....	
13,500	54,000	.007800	.001333	....	....	
13,750	55,000	.009000	.001200	....	....	
14,000	56,000	.010000	.001000	....	....	
14,250	57,000	.011167	.001167	....	....	
14,500	58,000	.012333	.001166	....	....	
14,750	59,000	.013333	.001000	....	....	
15,000	60,000	.014500	.001167	....	....	
15,500	62,000	.017267	.002767	....	....	
16,000	64,000	.019333	.002066	....	....	
16,500	66,000	.022067	.002734	....	....	
17,000	68,000	.024667	.002600	....	....	
17,500	70,000	.028167	.003500	....	....	
18,000	72,000	.031433	.003266	....	....	
18,500	74,000	.035600	.004167	....	....	
19,000	76,000	.039833	.004233	....	....	
19,500	78,000	.045600	.005767	....	....	
20,000	80,000	.054000	.008400	....	....	
20,500	82,000	.063000	.009000	....	....	
21,000	84,000	.076333	.013333	....	....	
21,500	86,000	.1067	.030367	....	....	
21,590	86,360	.1333	.0266	....	....	Tensile strength.

General summary.

Specific gravity..inch.. 7.8598
Hardness.. 14.54
Tensile strength per square inch of original section........................pounds.. 86,360
Elastic limit per square inch of original section ....do ... 45,000
Elongation per inch after rupture ....inch.. 0.2333
Elongation per inch under strain at elastic limit ....do .... .001533
Reduction in diameter at point of rupture ....do.... .154
Reduction in area after rupture, per centum of original section........................ 47.2
Position of rupture ....″.6 from middle of stem
Character of broken surface........................silky; traces of granulation
Elongation of inch section........................″.26*, ″.30*, ″.14

No. 889.

Marks, $\overset{8\ T_M}{M\ T_7\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads. Total.	Applied loads. Per square inch.	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Pounds.	Pounds.	Inch.	Inch.	Inch.	Inch.	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000067	.000034	
6,250	25,000	.000833	.000166	.000067	0.	
7,500	30,000	.001000	.000167	.000067	0.	
8,750	35,000	.001133	.000133	.000067	0.	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001200	0.	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001300	.000067	.000100	.000033	
10,250	41,000	.001367	.000067	....	....	
10,500	42,000	.001500	.000133	....	....	
10,750	43,000	.001567	.000067	....	....	Elastic limit.
11,000	44,000	.001767	.000200	....	....	
11,250	45,000	.002200	.000433	.000800	.000700	
11,500	46,000	.003533	.001333	....	....	
11,750	47,000	.004200	.000667	....	....	
12,000	48,000	.005267	.001067	....	....	
12,250	49,000	.006333	.001066	....	....	
12,500	50,000	.007533	.001200	.005667	.004867	
12,750	51,000	.008467	.000934	....	....	
13,000	52,000	.009267	.000800	....	....	
13,250	53,000	.010233	.000966	....	....	
13,500	54,000	.011467	.001234	....	....	
13,750	55,000	.012833	.001366	....	....	
14,000	56,000	.013667	.000834	....	....	
14,250	57,000	.014667	.001000	....	....	
14,500	58,000	.015833	.001166	....	....	
14,750	59,000	.016833	.001000	....	....	
15,000	60,000	.018200	.001367	....	....	
15,500	62,000	.020833	.002633	....	....	
16,000	64,000	.024000	.003167	....	....	
16,500	66,000	.027333	.003333	....	....	
17,000	68,000	.030700	.003367	....	....	
17,500	70,000	.034400	.003700	....	....	
18,000	72,000	.038667	.004267	....	....	
18,500	74,000	.044667	.006000	....	....	
19,000	76,000	.050667	.006000	....	....	
19,500	78,000	.059167	.008500	....	....	
20,000	80,000	.071167	.012000	....	....	
20,500	82,000	.0933	.022133	....	....	
20,8[illegible]	83,250	.1400	.0467	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 83, 2
Elastic limit per square inch of original section ....do.... 43, 0
Elongation per inch after rupture ....inch.. 0. 25
Elongation per inch under strain at elastic limit ....do.... .0015
Elongation per inch under point of rupture ....do.... .1
Reduction in diameter at rupture, per centum of original section.............................. 47
Reduction in area after rupture
Position of rupture ....″. 25 from middle of ste
Character of broken surface .... si
Elongation of inch sections .... ″. 19*, ″. 41, ″.

No. 890.

Marks, $_{M}{}^{8\,T_{34}}_{T_2,\,M}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000933	.000133	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001200	0.	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001300	.000033	.000033	.000033	
10,250	41,000	.001367	.000067	....	....	Elastic limit.
10,500	42,000	.001467	.000100	....	....	
10,750	43,000	.002033	.000566	....	....	
11,000	44,000	.004267	.002234	....	....	
11,250	45,000	.005433	.001166	.003867	.003834	
11,500	46,000	.006233	.000800	....	....	
11,750	47,000	.006767	.000534	....	....	
12,000	48,000	.007867	.001100	....	....	
12,250	49,000	.008700	.000833	....	....	
12,500	50,000	.010167	.001467	.008200	.004333	
12,750	51,000	.011000	.000833	....	....	
13,000	52,000	.011933	.000933	....	....	
13,250	53,000	.012633	.000700	....	....	
13,500	54,000	.014000	.001367	....	....	
13,750	55,000	.015000	.001000	....	....	
14,000	56,000	.016600	.001600	....	....	
14,250	57,000	.018000	.001400	....	....	
14,500	58,000	.019267	.001267	....	....	
14,750	59,000	.020500	.001233	....	....	
15,000	60,000	.022000	.001500	....	....	
15,500	62,000	.024833	.002833	....	....	
16,000	64,000	.027500	.002667	....	....	
16,500	66,000	.031000	.003500	....	....	
17,000	68,000	.034500	.003500	....	....	
17,500	70,000	.038333	.003833	....	....	
18,000	72,000	.043333	.005000	....	....	
18,500	74,000	.050667	.007334	....	....	
19,000	76,000	.058000	.007333	....	....	
19,500	78,000	.067833	.009833	....	....	
20,000	80,000	.0900	.022167	....	....	
20,500	82,000	.1167	.0267	....	....	
20,610	82,440	.1567	.0400	....	....	Tensile strength.
17,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82,440
Elastic limit, per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.163
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		silky, traces of granulation
Elongation of inch sections		″.18, ″.38*, ″.15

TUBE No. 25.—8″ *Converted Rifle.*

No. 914.

Marks, $\overset{8\,T_4}{B\,T_1\,1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	.000033	.000033	
2,500	10,000	.000333	.000200	.000033	0.	
3,750	15,000	.000500	.000167	.000067	.000034	
5,000	20,000	.000667	.000167	.000067	0.	
6,250	25,000	.000833	.000166	.000067	0.	
7,500	30,000	.001000	.000167	.000067	0.	
8,750	35,000	.001167	.000167	.000067	0.	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001300	.000033	....	....	
10,000	40,000	.001333	.000033	.000100	.000033	
10,250	41,000	.001333	0.	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.061567	.000167	....	....	
11,250	45,000	.001700	.000133	.000267	.000167	
11,500	46,000	.007067	.005367	....	....	
11,750	47,000	.007400	.000333	....	....	
12,000	48,000	.008500	.001100	....	....	
12,250	49,000	.009567	.001067	....	....	
12,500	50,000	.010733	.001166	.008867	.008600	
12,750	51,000	.011267	.000534	....	....	
13,000	52,000	.012267	.001100	....	....	
13,250	53,000	.013933	.001566	....	....	
13,500	54,000	.015400	.001467	....	....	
13,750	55,000	.016333	.000933	....	....	
14,000	56,000	.018000	.001667	....	....	
14,250	57,000	.019067	.001067	....	....	
14,500	58,000	.020700	.001633	....	....	
14,750	59,000	.021733	.001033	....	....	
15,000	60,000	.023500	.001767	....	....	
15,500	62,000	.026833	.003333	....	....	
16,000	64,000	.031500	.004667	....	....	
16,500	66,000	.035267	.003767	....	....	
17,000	68,000	.040300	.005033	....	....	
17,500	70,000	.046500	.006200	....	....	
18,000	72,000	.054000	.007500	....	....	
18,500	74,000	.062833	.008833	....	....	
19,000	76,000	.075667	.012834	....	....	
19,500	78,000	.1033	.027633	....	....	
19,700	78,800	.1600	.0567	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8590
Hardness		12.64
Tensile strength per square inch of original section	pounds..	78,800
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2433
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.85 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.18, ″.15

No. 915.

Marks, $^{3\,T_{35}}_{B\,T_{3}\,O}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000633	.000233	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	0.	....	
8,750	35,000	.001100	.000133	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000033	....	....	Elastic limit.
11,250	45,000	.001600	.000167	.000183	.000183	
11,500	46,000	.006033	.004433	....	....	
11,750	47,000	.006900	.000867	....	....	
12,000	48,000	.007867	.000967	....	....	
12,250	49,000	.009000	.001133	....	....	
12,500	50,000	.010200	.001200	.008267	.008184	
12,750	51,000	.010767	.000567	....	....	
13,000	52,000	.011700	.000933	....	....	
13,250	53,000	.012733	.001033	....	....	
13,500	54,000	.013967	.001234	....	....	
13,750	55,000	.015000	.001033	....	....	
14,000	56,000	.016300	.001300	....	....	
14,250	57,000	.017467	.001167	....	....	
14,500	58,000	.019000	.001533	....	....	
14,750	59,000	.020033	.001033	....	....	
15,000	60,000	.021733	.001700	....	....	
15,500	62,000	.024667	.002934	....	....	
16,000	64,000	.027667	.003000	....	....	
16,500	66,000	.030667	.003000	....	....	
17,000	68,000	.036667	.006000	....	....	
17,500	70,000	.041667	.005000	....	....	
18,000	72,000	.047067	.005400	....	....	
18,500	74,000	.053333	.006266	....	....	
19,000	76,000	.063333	.010000	....	....	
19,500	78,000	.075000	.011667	....	....	
20,000	80,000	.0967	.0217	....	....	
20,330	81,320	.1500	.0533	....	....	Tensile strength.
17,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81,320
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.153
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".37 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".20, ".38*, ".13

No. 916.

Marks, $\frac{8\ T_{38}}{B\ T_{3}\ M}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001400	.000067	....	....	
11,000	44,000	.001433	.000033	....	....	
11,250	45,000	.001467	.000034	.000067	.000067	Elastic limit.
11,500	46,000	.005667	.004200	....	....	
11,750	47,000	.006333	.000666	....	....	
12,000	48,000	.007367	.001034	....	....	
12,250	49,000	.008333	.000966	....	....	
12,500	50,000	.009667	.001334	.007767	.007700	
12,750	51,000	.010667	.001000	....	....	
13,000	52,000	.011667	.001000	....	....	
13,250	53,000	.012400	.000733	....	....	
13,500	54,000	.013500	.001100	....	....	
13,750	55,000	.014700	.001200	....	....	
14,000	56,000	.016167	.001467	....	....	
14,250	57,000	.017633	.001466	....	....	
14,500	58,000	.018733	.001100	....	....	
14,750	59,000	.019700	.000967	....	....	
15,000	60,000	.021833	.001833	....	....	
15,500	62,000	.024500	.003167	....	....	
16,000	64,000	.027500	.003000	....	....	
16,500	66,000	.031000	.003500	....	....	
17,000	68,000	.035133	.004133	....	....	
17,500	70,000	.040667	.005534	....	....	
18,000	72,000	.045667	.005000	....	....	
18,500	74,000	.052500	.006833	....	....	
19,000	76,000	.061533	.009033	....	....	
19,500	78,000	.073333	.011800	....	....	
20,000	80,000	.0967	.023367	....	....	
20,440	81,760	.1633	.0666	....	....	Tensile strength.
17,200	----------	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	81,760
Elastic limit per square inch of original section	do	45,000
Elongation per inch after rupture	inch	0.2667
Elongation per inch under strain of elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		″.17, ″.45*, ″.18

No. 917.

Marks, $\genfrac{}{}{0pt}{}{8\,T_{25}}{M\,T_1\,I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.*	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	**Initial load.**
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001233	.000166	0.	....	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001400	.000067	....	....	
11, 250	45, 000	.001433	.000033	.000067	.000067	**Elastic limit.**
11, 500	46, 000	.002100	.000667	....	....	
11, 750	47, 000	.002567	.000467	....	....	
12, 000	48, 000	.003200	.000633	....	....	
12, 250	49, 000	.004067	.000867	....	....	
12, 500	50, 000	.006667	.002600	.004900	.004833	
12, 750	51, 000	.007067	.000400	....	....	
13, 000	52, 000	.007800	.000733	....	....	
13, 250	53, 000	.008467	.000667	....	....	
13, 500	54, 000	.010000	.001533	....	....	
13. 750	55, 000	.010867	.000867	....	....	
14, 000	56, 000	.012133	.001266	....	....	
14, 250	57, 000	.012900	.000767	....	....	
14, 500	58, 000	.014667	.001767	....	....	
14, 750	59, 000	.015667	.001000	....	....	
15, 000	60, 000	.016867	.001200	....	....	
15, 500	62, 000	.020000	.003133	....	....	
16, 000	64, 000	.022333	.002333	....	....	
16, 500	66, 000	.025000	.002667	....	....	
17, 000	68, 000	.029000	.004000	....	....	
17, 500	70, 000	.032500	.003500	....	....	
18, 000	72, 000	.036333	.003833	....	....	
18, 500	74, 000	.041333	.005000	....	....	
19, 000	76, 000	.046667	.005334	....	....	
19, 500	78, 000	.054667	.008000	....	....	
20, 000	80, 000	.064500	.009833	....	....	
20, 500	82, 000	.078333	.013833	....	....	
21, 000	84, 000	.1100	.031667	....	....	**Tensile strength.**
21, 020	84, 080	.1333	.0233	....	....	**Load at time of rupture.**
18, 100	....	....	....	....	....	

General summary.

Specific gravity		7. 8551
Hardness		13. 59
Tensile strength per square inch of original section	pounds..	84, 080
Elastic limit per square inch of original section	do ...	45, 000
Elongation per inch after rupture	inch..	0. 2033
Elongation per inch under strain at elastic limit	do....	.001433
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section	....	47. 2
Position of rupture		".75 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		".38*, ".13, ".10

No. 918.

Marks, 8 T M T, O
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	Pounds.	Inch.	Inch.	Inch.	Inch.	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.006433	.005033	....	....	
11,250	45,000	.008467	.002034	.006733	.006733	
11,500	46,000	.009700	.001233	....	....	
11,750	47,000	.010333	.000633	....	....	
12,000	48,000	.011500	.001167	....	....	
12,250	49,000	.012533	.001033	....	....	
12,500	50,000	.013833	.001300	.012000	.005267	
12,750	51,000	.014667	.000834	....	....	
13,000	52,000	.015967	.001300	....	....	
13,250	53,000	.017333	.001366	....	....	
13,500	54,000	.019467	.002134	....	....	
13,750	55,000	.020833	.001366	....	....	
14,000	56,000	.022067	.001234	....	....	
14,250	57,000	.023233	.001166	....	....	
14,500	58,000	.024700	.001467	....	....	
14,750	59,000	.026167	.001467	....	....	
15,000	60,000	.028000	.001833	....	....	
15,500	62,000	.031733	.003733	....	....	
16,000	64,000	.036000	.004267	....	....	
16,500	66,000	.040600	.004600	....	....	
17,000	68,000	.046667	.006067	....	....	
17,500	70,000	.054500	.007833	....	....	
18,000	72,000	.063333	.008833	....	....	
18,500	74,000	.074833	.011500	....	....	
19,000	76,000	.1000	.025167	....	....	
19,320	77,280	.1400	.0400	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..................................pounds.. 77,280
Elastic limit per square inch of original section..................................do ... 42,000
Elongation per inch after rupture..................................inch.. 0.2200
Elongation per inch under strain at elastic limit..................................do ... .001400
Reduction in diameter at point of rupture..................................do.... .174
Reduction in area after rupture, per centum of original section.................................. 52.2
Position of rupture..................................".62 from neck
Character of broken surface..................................silky
Elongation of inch sections..................................".42*, ".14 ".10

No. 919.

Marks, $\overset{8\,T_{38}}{M\ T_{3}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	.000033	.000033	
7,500	30,000	.001000	.000167	.000033	0.	
8,750	35,000	.001167	.000167	.000033	0.	
10,000	40,000	.001300	.000133	.000033	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000033	....	....	Elastic limit.
11,250	45,000	.001533	.000100	.000167	.000134	
11,500	46,000	.001667	.000134	....	....	
11,750	47,000	.001800	.000133	....	....	
12,000	48,000	.003500	.001700	....	....	
12,250	49,000	.005000	.001500	....	....	
12,500	50,000	.006333	.001333	.004467	.004300	
12,750	51,000	.006900	.000567	....	....	
13,000	52,000	.007433	.000533	....	....	
13,250	53,000	.008400	.000967	....	....	
13,500	54,000	.009267	.000867	....	....	
13,750	55,000	.010533	.001266	....	....	
14,000	56,000	.011800	.001267	....	....	
14,250	57,000	.012867	.001067	....	....	
14,500	58,000	.013733	.000866	....	....	
14,750	59,000	.014500	.000767	....	....	
15,000	60,000	.015667	.001167	....	....	
15,500	62,000	.018167	.002500	....	....	
16,000	64,000	.021333	.003166	....	....	
16,500	66,000	.025000	.003667	....	....	
17,000	68,000	.027667	.002667	....	....	
17,500	70,000	.030333	.002666	....	....	
18,000	72,000	.033667	.003334	....	....	
18,500	74,000	.038000	.004333	....	....	
19,000	76,000	.042833	.004833	....	....	
19,500	78,000	.048333	.005500	....	....	
20,000	80,000	.055833	.007500	....	....	
20,500	82,000	.063667	.007834	....	....	
21,000	84,000	.0833	.019633	....	....	
21,500	86,000	.1233	.0400	....	....	
21,520	86,080	.1567	.0334	....	....	Tensile strength.
19,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	86,080
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.2300
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.75 inch from middle of stem
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		″.25*, ″.19, ″.15

TUBE No. 26.—8″ *Converted Rifle.*

No. 968.

Marks, $^{8\,T_{26}}_{B\,T_1\,I}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000533	.000133	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001233	.000066	.000033	.000033	Elastic limit.
10,250	41,000	.001767	.000534	....	....	
10,500	42,000	.003733	.001966	....	....	
10,750	43,000	.004933	.001200	....	....	
11,000	44,000	.005933	.001000	....	....	
11,250	45,000	.007000	.001067	.005467	.005434	
11,500	46,000	.008267	.001267	....	....	
11,750	47,000	.009267	.001000	....	....	
12,000	48,000	.010467	.001200	....	....	
12,250	49,000	.012133	.001666	....	....	
12,500	50,000	.013467	.001334	.011600	.006133	
12,750	51,000	.014433	.000966	....	....	
13,000	52,000	.015433	.001000	....	....	
13,250	53,000	.016833	.001400	....	....	
13,500	54,000	.018167	.001334	....	....	
13,750	55,000	.019900	.001733	....	....	
14,000	56,000	.021667	.001767	....	....	
14,250	57,000	.023133	.001466	....	....	
14,500	58,000	.024833	.001700	....	....	
14,750	59,000	.026667	.001834	....	....	
15,000	60,000	.028467	.001800	....	....	
15,500	62,000	.032367	.003900	....	....	
16,000	64,000	.037333	.004966	....	....	
16,500	66,000	.043733	.006400	....	....	
17,000	68,000	.050667	.006934	....	....	
17,500	70,000	.059333	.008666	....	....	
18,000	72,000	.071667	.012334	....	....	
18,500	74,000	.0967	.025033	....	....	
18,800	75,200	.1533	.0566	....	....	Tensile strength.

General summary.

Specific gravity 7.8571
Hardness 12.96
Tensile strength per square inch of original section .... pounds.. 75,200
Elastic limit per square inch of original section .... do.... 40,000
Elongation per inch after rupture .... inch.. 0.2033
Elongation per inch under strain at elastic limit .... do.... .001233
Reduction in diameter at point of rupture .... do.... .083
Reduction in area after rupture, per centum of original section 27.6
Position of rupture .... ″.5 from middle of stem
Character of broken surface .... granular, dull silky spot at the circumference
Elongation of inch sections .... ″.19, ″.27*, ″.15

No. 969.

Marks, $\frac{8\ T\ 33}{B\ T_2\ O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000900	.000133	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001 33	.000036	.000033	.000033	
10,250	41,000	.001267	.000034	....	....	Elastic limit.
10,500	42,000	.001933	.000666	....	....	
10,750	43,000	.004067	.002134	....	....	
11,000	44,000	.005600	.001533	....	....	
11,250	45,000	.006600	.001000	.005000	.004967	
11,500	46,000	.007933	.001333	....	....	
11,750	47,000	.008533	.000600	....	....	
12,000	48,000	.009733	.001200	....	....	
12,250	49,000	.010700	.000967	....	....	
12,500	50,000	.011933	.001233	.010100	.005100	
12,750	51,000	.013667	.001734	....	....	
13,000	52,000	.014933	.001266	....	....	
13,250	53,000	.015667	.000734	....	....	
13,500	54,000	.016667	.001000	....	....	
13,750	55,000	.018067	.001400	....	....	
14,000	56,000	.019667	.001600	....	....	
14,250	57,000	.021100	.001433	....	....	
14,500	58,000	.022833	.001733	....	....	
14,750	59,000	.024333	.001500	....	....	
15,000	60,000	.025933	.001600	....	....	
15,500	62,000	.029833	.003900	....	....	
16,000	64,000	.033667	.003834	....	....	
16,500	66,000	.038100	.004433	....	....	
17,000	68,000	.044333	.006233	....	....	
17,500	70,000	.050000	.007667	....	....	
18,000	72,000	.059000	.009000	....	....	
18,500	74,000	.071667	.012667	....	....	
19,000	76,000	.0933	.021633	....	....	
19,480	77,920	.1567	.0634	....	....	Tensile strength.
17,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..................................pounds.. 77,920
Elastic limit per square inch of original section..do.... 41,000
Elongation per inch after rupture ....inch.. 0.2300
Elongation per inch under strain at elastic limit ....do.... .001267
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section 86.4
Position of rupture .... ″.75 from middle of stem
Character of broken surface, granular, dull silky spot at circumference, cracks developed in cylindrical surface of stem.
Elongation of inch sections...″.30*, ″.25, ″.14

No. 970.

Marks, $^{8\,T_{38}}_{B\,T_2\,M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	— .000033	—.000033	
2,500	10,000	.000200	.000167	—.000033	0.	
3,750	15,000	.000367	.000167	—.000033	0.	
5,000	20,000	.000500	.000133	—.000033	0.	
6,250	25,000	.000633	.000133	—.000033	0.	
7,500	30,000	.000800	.000167	—.000033	0.	
8,750	35,000	.000967	.000167	—.000033	0.	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001067	0.	....	....	
10,000	40,000	.001100	.000033	—.000033	0.	Elastic limit.
10,250	41,000	.001400	.000300	....	....	
10,500	42,000	.003167	.001767	....	....	
10,750	43,000	.004467	.001300	....	....	
11,000	44,000	.005633	.001166	....	....	
11,250	45,000	.006667	.001034	.005100	.005133	
11,500	46,000	.008167	.001500	....	....	
11,750	47,000	.008600	.000433	....	....	
12,000	48,000	.009667	.001067	....	....	
12,250	49,000	.010600	.000933	....	....	
12,500	50,000	.011700	.001100	.009667	.004767	
12,750	51,000	.012333	.000633	....	....	
13,000	52,000	.013267	.000934	....	....	
13,250	53,000	.014500	.001233	....	....	
13,500	54,000	.015833	.001333	....	....	
13,750	55,000	.017600	.001767	....	....	
14,000	56,000	.018600	.001000	....	....	
14,250	57,000	.019900	.001300	....	....	
14,500	58,000	.021867	.001967	....	....	
14,750	59,000	.023233	.001366	....	....	
15,000	60,000	.025000	.001767	....	....	
15,500	62,000	.028333	.003333	....	....	
16,000	64,000	.031667	.003334	....	....	
16,500	66,000	.036467	.004800	....	....	
17,000	68,000	.041667	.005200	....	....	
17,500	70,000	.047667	.006000	....	....	
18,000	72,000	.055000	.007333	....	....	
18,500	74,000	.066667	.011667	....	....	
19,000	76,000	.0833	.016633	....	....	
19,500	78,000	.1267	.0434	....	....	
19,550	78,200	.1567	.0300	....	....	Tensile strength.
15,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,200
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2700
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		at middle of stem, oblique
Character of broken surface		silky
Elongation of inch sections		".19, ".46", ".16

No. 971.

Marks, $\overset{S}{M}\,\overset{T_m}{T_1}\,I$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001100	0.	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001300	.000067	....	....	
10,500	42,000	.001367	.000067	....	....	
10,750	43,000	.001467	.000100	....	....	
11,000	44,000	.001533	.000066	....	....	Elastic limit.
11,250	45,000	.002467	.000934	.000067	.000067	
11,500	46,000	.004267	.001800	....	....	
11,750	47,000	.004933	.000666	....	....	
12,000	48,000	.006000	.001067	....	....	
12,250	49,000	.007000	.001000	....	....	
12,500	50,000	.008333	.001333	.006433	.005466	
12,750	51,000	.009000	.000667	....	....	
13,000	52,000	.009800	.000800	....	....	
13,250	53,000	.011000	.001200	....	....	
13,500	54,000	.012167	.001167	....	....	
13,750	55,000	.013267	.001100	....	....	
14,000	56,000	.014333	.001066	....	....	
14,250	57,000	.015167	.000834	....	....	
14,500	58,000	.016733	.001566	....	....	
14,750	59,000	.018033	.001300	....	....	
15,000	60,000	.019500	.001467	....	....	
15,500	62,000	.021933	.002433	....	....	
16,000	64,000	.025167	.003234	....	....	
16,500	66,000	.028333	.003166	....	....	
17,000	68,000	.031867	.003534	....	....	
17,500	70,000	.037600	.005733	....	....	
18,000	72,000	.042167	.004567	....	....	
18,500	74,000	.048333	.006166	....	....	
19,000	76,000	.056667	.008334	....	....	
19,500	78,000	.068333	.011666	....	....	
20,000	80,000	.0867	.018367	....	....	
20,470	81,880	.1433	.0566	....	....	Tensile strength.
20,300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8561
Hardness	16.15
Tensile strength per square inch of original section ....pounds..	81,880
Elastic limit per square inch of original section ....do....	44,000
Elongation per inch after rupture ....inch..	0.1800
Elongation per inch under strain at elastic limit ....do....	.001533
Reduction in diameter at point of rupture ....do....	.064
Reduction in area after rupture, per centum of original section	21.4
Position of rupture	.1″ from neck
Character of broken surface	granular, small dull spot at the circumference
Elongation of inch sections	″.20*, ″.20, ″.14

No. 972.

Marks, $^{S\,T_8}_{M\,T_2}O$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000433	.000100	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	.000033	.000033	
7,500	30,000	.000967	.000167	.000033	0.	
8,750	35,000	.001133	.000166	.000067	.000034	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000100	.000033	Elastic limit.
10,250	41,000	.001400	.000100	....	....	
10,500	42,000	.001467	.000067	....	....	
10,750	43,000	.001700	.000233	....	....	
11,000	44,000	.002467	.000767	....	....	
11,250	45,000	.003800	.001333	.002167	.002067	
11,500	46,000	.004667	.000867	....	....	
11,750	47,000	.005067	.000400	....	....	
12,000	48,000	.006200	.001133	....	....	
12,250	49,000	.007267	.001067	....	....	
12,500	50,000	.008233	.000966	.006333	.004166	
12,750	51,000	.008933	.000700	....	....	
13,000	52,000	.009933	.001000	....	....	
13,250	53,000	.010600	.000667	....	....	
13,500	54,000	.011933	.001333	....	....	
13,750	55,000	.013033	.001100	....	....	
14,000	56,000	.014000	.000967	....	....	
14,250	57,000	.015000	.001000	....	....	
14,500	58,000	.016167	.001167	....	....	
14,750	59,000	.017067	.000900	....	....	
15,000	60,000	.018600	.001533	....	....	
15,500	62,000	.020833	.002233	....	....	
16,000	64,000	.024333	.003500	....	....	
16,500	66,000	.027067	.002734	....	....	
17,000	68,000	.030400	.003333	....	....	
17,500	70,000	.034333	.003933	....	....	
18,000	72,000	.038667	.004334	....	....	
18,500	74,000	.044000	.005333	....	....	
19,000	76,000	.050000	.006000	....	....	
19,500	78,000	.057500	.007500	....	....	
20,000	80,000	.069167	.011667	....	....	
20,500	82,000	.0933	.024133	....	....	
20,940	83,760	.1467	.0534	....	....	Tensile strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	83,700
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2433
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do ...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".75 from neck
Character of broken surface		silky, with traces of granulation
Elongation of inch sections		".39*, ".19, ".15

No. 973.

Marks, $\overset{8\ T_{28}}{M\ T_{3}\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001100	0.	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001167	.000034	....	....	
10, 000	40, 000	.001200	.000033	0.	....	
10, 250	41, 000	.001267	.000067	....	....	Elastic limit.
10, 500	42, 000	.001367	.000100	....	....	
10, 750	43, 000	.001467	.000100	....	....	
11, 000	44, 000	.001700	.000233	....	....	
11, 250	45, 000	.002533	.000833	.001033	.001033	
11, 500	46, 000	.004067	.001534	....	....	
11, 750	47, 000	.004767	.000700	....	....	
12, 000	48, 000	.005833	.001066	....	....	
12, 250	49, 000	.006833	.001000	....	....	
12, 500	50, 000	.008267	.001434	.006233	.005200	
12, 750	51, 000	.008767	.000500	....	....	
13, 000	52, 000	.009833	.001066	....	....	
13, 250	53, 000	.010833	.001000	....	....	
13, 500	54, 000	.011833	.001000	....	....	
13, 750	55, 000	.012733	.000900	....	....	
14, 000	56, 000	.013833	.001100	....	....	
14, 250	57, 000	.014833	.001000	....	....	
14, 500	58, 000	.016333	.001500	....	....	
14, 750	59, 000	.017400	.001067	....	....	
15, 000	60, 000	.018700	.001300	....	....	
15, 500	62, 000	.021667	.002967	....	....	
16, 000	64, 000	.024267	.002600	....	....	
16, 500	66, 000	.027533	.003266	....	....	
17, 000	68, 000	.030833	.003300	....	....	
17, 500	70, 000	.034833	.004000	....	....	
18, 000	72, 000	.039667	.004834	....	....	
18, 500	74, 000	.045000	.005333	....	....	
19, 000	76, 000	.050867	.005867	....	....	
19, 500	78, 000	.060400	.009533	....	....	
20, 000	80, 000	.071667	.011267	....	....	
20, 500	82, 000	.0967	.025033	....	....	
20, 750	83, 000*	.1533	.0566	....	....	Tensile strength.
17, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	83, 000
Elastic limit per square inch of original section	do....	41, 000
Elongation per inch after rupture	inch..	0. 2567
Elongation per inch under strain at elastic limit	do....	.001207
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49. 7
Position of rupture		″.55 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.25, ″.38*, ″.14

TUBE No. 28.—8″ *Converted Rifle.*

No. 936.

Marks, $^{8}_{B}\,^{T_s}_{T_1}\,\mathrm{I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	.000033	.000033	
6,200	25,000	.000767	.000167	.000033	0.	
7,500	30,000	.000900	.000133	.000067	.000034	
8,750	35,000	.001033	.000133	.000067	0.	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001133	0.	....	....	
10,000	40,000	.001200	.000067	.000100	.000033	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001367	.000034	.000100	0.	Elastic limit.
11,500	46,000	.001501	.000133	....	....	
11,750	47,000	.002033	.000533	....	....	
12,000	48,000	.003067	.001034	....	....	
12,250	49,000	.004667	.001600	....	....	
12,500	50,000	.006333	.001666	....	....	
12,750	51,000	.007867	.001534	....	....	
13,000	52,000	.008633	.000766	....	....	
13,250	53,000	.009333	.000700	....	....	
13,500	54,000	.010333	.001000	....	....	
13,750	55,000	.011867	.001534	....	....	
14,000	56,000	.013500	.001633	....	....	
14,250	57,000	.014667	.001167	....	....	
14,500	58,000	.016167	.001500	....	....	
14,750	59,000	.017067	.000900	....	....	
15,000	60,000	.018600	.001533	....	....	
15,500	62,000	.021700	.003100	....	....	
16,000	64,000	.025000	.003300	....	....	
16,500	66,000	.028833	.003833	....	....	
17,000	68,000	.034000	.005167	....	....	
17,500	70,000	.037933	.003933	....	....	
18,000	72,000	.043733	.005800	....	....	
18,500	74,000	.050667	.006934	....	....	
19,000	76,000	.060333	.009666	....	....	
19,500	78,000	.076333	.016000	....	....	
20,000	80,000	.1067	.030367	....	....	
20,060	80,240	.1367	.0300	....	....	Tensile strength.
16,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8667
Hardness		14.54
Tensile strength per square inch of original section	pounds..	80,240
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001367
Elongation per inch at point of rupture	do....	.174
Reduction in diameter after rupture per centum of original section		52.2
Reduction in area		
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.41*, ″.18, ″.18

No. 937.

Marks, $\mathrm{B}\,\overset{3T_{3}}{T_{3}}\,\mathrm{O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000900	.000133	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001200	.000067	....	....	
10,000	40,000	.001233	.000033	.000100	.000100	
10,250	41,000	.001367	.000034	....	....	Elastic limit.
10,500	42,000	.001733	.000366	....	....	
10,750	43,000	.002600	.000867	....	....	
11,000	44,000	.003500	.000900	....	....	
11,250	45,000	.004567	.001067	.003033	.002933	
11,500	46,000	.005533	.000966	....	....	
11,750	47,000	.006233	.000700	....	....	
12,000	48,000	.007100	.000867	....	....	
12,250	49,000	.008133	.001033	....	....	
12,500	50,000	.009933	.001800	.008067	.005034	
12,750	51,000	.010400	.000407	....	....	
13,000	52,000	.011267	.000867	....	....	
13,250	53,000	.012100	.000833	....	....	
13,500	54,000	.013333	.001233	....	....	
13,750	55,000	.014600	.001267	....	....	
14,000	56,000	.015733	.001133	....	....	
14,250	57,000	.016900	.001167	....	....	
14,500	58,000	.018400	.001500	....	....	
14,750	59,000	.019433	.001033	....	....	
15,000	60,000	.020833	.001400	....	....	
15,500	62,000	.024000	.003167	....	....	
16,000	64,000	.027067	.003067	....	....	
16,500	66,000	.030833	.003766	....	....	
17,000	68,000	.034833	.004000	....	....	
17,500	70,000	.039200	.004367	....	....	
18,000	72,000	.045000	.005800	....	....	
18,500	74,000	.051500	.006500	....	....	
19,000	76,000	.061500	.010000	....	....	
19,500	78,000	.072667	.011167	....	....	
20,000	80,000	.0867	.014033	....	....	
20,500	82,000	.1300	.0433	....	....	Tensile strength.
17,300	.....?.....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82,000
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".7 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".32*, ".25, ".11

No. 938.

Marks, $\mathrm{B}\,{}^{8}\mathrm{T}_{3}^{\mathrm{T}_{2}}\mathrm{M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15 000	.000367	.000134	0.	....	
5, 000	20, 000	.000583	.000166	0.	....	
6, 250	25, 000	.000667	.000134	0.	....	
7, 500	30, 000	.000800	.000133	0.	....	
8, 750	35, 000	.000967	.000167	0.	....	
9, 000	36, 000	.001000	.000033	....	....	
9, 250	37, 000	.001033	.000033	....	....	
9, 500	38, 000	.001067	.000034	....	....	
9, 750	39, 000	.001100	.000033	....	....	
10, 000	40, 000	.001133	.000033	.000033	.000033	
10, 250	41, 000	.001200	.000067	....	....	
10, 500	42, 000	.001233	.000033	....	....	
10, 750	43, 000	.001267	.000034	....	....	Elastic limit.
11, 000	44, 000	.001400	.000133	....	....	
11, 250	45, 000	.001900	.000500	.000500	.000467	
11, 500	46, 000	.003267	.001367	....	....	
11, 750	47, 000	.004333	.001066	....	....	
12, 000	48, 000	.005333	.001000	....	....	
12, 250	49, 000	.006233	.000900	....	....	
12, 500	50, 000	.007233	.001000	.005567	.005067	
12, 750	51, 000	.007767	.000534	....	....	
13, 000	52, 000	.008833	.001066	....	....	
13, 250	53, 000	.009867	.001034	....	....	
13, 500	54, 000	.011133	.001266	....	....	
13, 750	55, 000	.012333	.001200	....	....	
14, 000	56, 000	.013500	.001167	....	....	
14, 250	57, 000	.014900	001400	....	....	
14, 500	58, 000	.016167	.001267	....	....	
14, 750	59, 000	.017300	.001133	....	....	
15, 000	60, 000	.018700	.001400	....	....	
15, 500	62, 000	.021167	.002467	....	....	
16, 000	64, 000	.024267	.003100	....	....	
16, 500	66, 000	.027500	.003233	....	....	
17, 000	68, 000	.031367	.003867	....	....	
17, 500	70, 000	.035333	.003966	....	....	
18, 000	72, 000	.040067	.005334	....	....	
18, 500	74, 000	.046333	.005666	....	....	
19, 000	76, 000	.053667	.007334	....	....	
19, 500	78, 000	.063333	.009666	....	....	
20, 000	80, 000	.081333	.018000	....	....	
20, 500	82, 000	.1267	.045367	....	....	Tensile strength.
17, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82, 000
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 2233
Elongation per inch under strain at elastic limit	do....	.001267
Elongation per inch at point of rupture	do....	.164
Reduction in diameter after rupture, per centum of original section		49. 7
Reduction in area after rupture		
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.39*, ″.18, ″.10

No. 939.

Marks, $\overset{8\,T_{38}}{M\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000700	.000100	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
9,000	36,000	.001033	0.	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001167	.000034	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	Elastic limit.
11,750	47,000	.001567	.000200	....	....	
12,000	48,000	.002100	.000533	....	....	
12,250	49,000	.002633	.000533	....	....	
12,500	50,000	.003500	.000867	.001800	.001800	
12,750	51,000	.005233	.001733	....	....	
13,000	52,000	.006133	.000900	....	....	
13,250	53,000	.006900	.000767	....	....	
13,500	54,000	.008800	.001900	....	....	
13,750	55,000	.009467	.000667	....	....	
14,000	56,000	.010467	.001000	....	....	
14,250	57,000	.011567	.001100	....	....	
14,500	58,000	.012733	.001166	....	....	
14,750	59,000	.013700	.000967	....	....	
15,000	60,000	.014833	.001133	....	....	
15,500	62,000	.017400	.002567	....	....	
16,000	64,000	.020133	.002733	....	....	
16,500	66,000	.023167	.003034	....	....	
17,000	68,000	.027000	.003833	....	....	
17,500	70,000	.030233	.003233	....	....	
18,000	72,000	.034167	.003934	....	....	
18,500	74,000	.038667	.004500	....	....	
19,000	76,000	.044167	.005500	....	....	
19,500	78,000	.051667	.007500	....	....	
20,000	80,000	.060000	.008333	....	....	
20,500	82,000	.074167	.014167	....	....	
20,990	83,960	.1200	.045833	....	....	Tensile strength.
17,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8606
Hardness		15.20
Tensile strength per square inch of original section	pounds	83,960
Elastic limit per square inch of original section	do	46,000
Elongation per inch after rupture	inch	0.2067
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.6 from neck
Character of broken surface		silky
Elongation of inch sections		″.40*, ″.12, ″.09

No. 940.

Marks, $\overset{8}{M}\,\overset{T_8}{T_2}O$
Diameter, **".564.**
Sectional **area, .25 square inch.**

Applied loads.		Elongation Per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	Elastic limit.
11,250	45,000	.001533	.000166	.000233	.000233	
11,500	46,000	.004000	.002467	....	....	
11,750	47,000	.004733	.000733	....	....	
12,000	48,000	.005400	.000667	....	....	
12,500	49,000	.006133	.000733	....	....	
12,500	50,000	.007367	.001234	.005633	.005400	
12,750	51,000	.008100	.000733	....	....	
13,000	52,000	.009300	.001200	....	....	
13,250	53,000	.009867	.000567	....	....	
13,500	54,000	.010867	.001000	....	....	
13,750	55,000	.011933	.001066	....	....	
14,000	56,000	.013167	.001234	....	....	
14,250	57,000	.014033	.000866	....	....	
14,500	58,000	.015333	.001300	....	....	
14,750	59,000	.016333	.001000	....	....	
15,000	60,000	.017667	.001334	....	....	
15,500	62,000	.020667	.003000	....	....	
16,000	64,000	.023333	.002666	....	....	
16,500	66,000	.026333	.003000	....	....	
17,000	68,000	.029000	.002667	....	....	
17,500	70,000	.032700	.003700	....	....	
18,000	72,000	.037200	.004500	....	....	
18,500	74,000	.041367	.004167	....	....	
19,000	76,000	.048333	.006966	....	....	
19,500	78,000	.055833	.007500	....	....	
20,000	80,000	.065000	.009167	....	....	
20,500	82,000	.079000	.014000	....	....	
21,000	84,000	.1067	.0277	....	....	
21,140	84,560	.1600	.0533	....	....	Tensile strength.
17,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	84,560
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.2533
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".25 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".19, ".44*, ".13

No. 941.

Marks, $\mathrm{M}\,\overset{8\;\mathrm{T_{38}}}{\mathrm{T_3}}\,\mathrm{M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000400	.000133	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000733	.000166	0.		
7,500	30,000	.000900	.000167	0.		
8,750	35,000	.001067	.000167	0.		
9,000	36,000	.001067	0.			
9,250	37,000	.001100	.000033			
9,500	38,000	.001133	.000033			
9,750	39,000	.001167	.000034			
10,000	40,000	.001233	.000066	.000067	.000067	
10,250	41,000	.001300	.000067			
10,500	42,000	.001367	.000067			
10,750	43,000	.001400	.000033			Elastic limit.
11,000	44,000	.003200	.001800			
11,250	45,000	.004133	.000933	.002600	.002533	
11,500	46,000	.005233	.001100			
11,750	47,000	.005567	.000334			
12,000	48,000	.006333	.000766			
12,250	49,000	.007267	.000934			
12,500	50,000	.008367	.001100	.006567	.003967	
12,750	51,000	.009133	.000766			
13,000	52,000	.010067	.000934			
13,250	53,000	.010800	.000733			
13,500	54,000	.012133	.001333			
13,750	55,000	.012833	.000700			
14,000	56,000	.014000	.001167			
14,250	57,000	.015333	.001333			
14,500	58,000	.016600	.001267			
14,750	59,000	.017667	.001067			
15,000	60,000	.019000	.001333			
15,500	62,000	.021333	.002333			
16,000	64,000	.024500	.003167			
16,500	66,000	.027333	.002833			
17,000	68,000	.030667	.003334			
17,500	70,000	.035333	.004666			
18,000	72,000	.039500	.004167			
18,500	74,000	.044500	.005000			
19,000	76,000	.050533	.006033			
19,500	78,000	.059167	.008634			
20,000	80,000	.0733	.014133			
20,500	82,000	.0867	.0134			
21,000	84,000	.1233	.0366			
21,050	84,200	.1533	.0300			Tensile strength.
18,000						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	84,200
Elastic limit per square inch of original section	do	43,000
Elongation after rupture	inch	0.2467
Elongation under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		".17, ".42*, ".15

TUBE No. 29.—8" *Converted Rifle.*

No. 929.

Marks, $\overset{8\ T}{B\ T,\ I}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000600	.000167	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001100	.000167	0.		
9,000	36,000	.001100	0.			
9,250	37,000	.001133	.000033			
9,500	38,000	.001167	.000034			
9,750	39,000	.001233	.000066			
10,000	40,000	.001300	.000067	.000067	.000067	Elastic limit.
10,250	41,000	.001933	.000633			
10,500	42,000	.002600	.001667			
10,750	43,000	.004167	.000567			
11,000	44,000	.005167	.001000			
11,250	45,000	.006067	.000900	.004467	.004400	
11,500	46,000	.007400	.001333			
11,750	47,000	.008067	.000667			
12,000	48,000	.009500	.001433			
12,250	49,000	.010333	.000833			
12,500	50,000	.011433	.001100	.009667	.005200	
12,750	51,000	.012367	.000934			
13,000	52,000	.013333	.000966			
13,250	53,000	.014667	.001334			
13,500	54,000	.016333	.001666			
13,750	55,000	.017500	.001167			
14,000	56,000	.018833	.001333			
14,250	57,000	.020067	.001234			
14,500	58,000	.021667	.001600			
14,750	59,000	.023333	.001666			
15,000	60,000	.025333	.002000			
15,500	62,000	.028600	.003267			
16,000	64,000	.032333	.003733			
16,500	66,000	.037100	.004767			
17,000	68,000	.042100	.005000			
17,500	70,000	.049000	.006900			
18,000	72,000	.057933	.008933			
18,500	74,000	.069000	.012067			
19,000	76,000	.0900	.0210			
19,500	78,000	.1300	.0400			
19,540	78,160	.1600	.0300			Tensile strength.
16,700						Load at time of rupture.

General summary.

Specific gravity 7.8585
Hardness 10.24
Tensile strength per square inch of original section .... pounds.. 78,160
Elastic limit per square inch of original section .... do.... 40,000
Elongation per inch after rupture .... inch.. 0.2567
Elongation per inch under strain at elastic limit .... do.... .001300
Reduction in diameter at point of rupture .... do.... .174
Reduction in area after rupture, per centum of original section 52.2
Position of rupture .... ".37 from middle of stem; oblique
Character of broken surface .... silky
Elongation of inch sections .... ".20, ".48*, ".14

No. 930.

Marks, $^{S\,T_{29}}_{B\,T_{2}\,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000467	.000134	0.	....	
6,250	25,000	.000667	.000200	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.001000	.000167	0.	....	
9,000	36,000	.001000	0.	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001133	.000033	0.	....	Elastic limit.
10,250	41,000	.001233	.000100	....	....	
10,500	42,000	.001367	.000134	....	....	
10,750	43,000	.002900	.000533	....	....	
11,000	44,000	.004767	.001867	....	....	
11,250	45,000	.005767	.001000	.004200	.004200	
11,500	46,000	.006767	.001000	....	....	
11,750	47,000	.007400	.000633	....	....	
12,000	48,000	.008733	.001333	....	....	
12,250	49,000	.009767	.001034	....	....	
12,500	50,000	.011033	.001266	.009267	.005067	
12,750	51,000	.011667	.000634	....	....	
13,000	52,000	.012900	.001233	....	....	
13,250	53,000	.014033	.001133	....	....	
13,500	54,000	.015400	.001367	....	....	
13,750	55,000	.016667	.001267	....	....	
14,000	56,000	.018500	.001833	....	....	
14,250	57,000	.020033	.001533	....	....	
14,500	58,000	.021567	.001534	....	....	
14,750	59,000	.022733	.001166	....	....	
15,000	60,000	.024600	.001867	....	....	
15,500	62,000	.028100	.003500	....	....	
16,000	64,000	.032033	.003933	....	....	
16,500	66,000	.036167	.004134	....	....	
17,000	68,000	.042833	.006666	....	....	
17,500	70,000	.049267	.006434	....	....	
18,000	72,000	.056000	.006733	....	....	
18,500	74,000	.066000	.010000	....	....	
19,000	76,000	.090000	.024000	....	....	
19,460	77,840	.1533	.0633	....	....	Tensile strength.
16,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77,840
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2600
Elongation per inch under strain at elastic limit	do....	.001133
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section	....	52.2
Position of rupture		".25 from middle of stem
Character of broken surface		silky; cup-shaped ends
Elongation of inch sections		".17, ".16, ".15

No. 931.

Marks, $\overset{8\ T_2}{B\ T_2\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	*Per square inch.*					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	.000033	.000033	
5,000	20,000	.000600	.000167	.000033	0.	
6,250	25,000	.000767	.000167	.000067	.000034	
7,500	30,000	.000933	.000166	.000067	0.	
8,750	35,000	.001100	.000167	.000067	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001333	.000066	.000100	.000033	
10,250	41,000	.001400	.000067	....	....	Elastic limit.
10,500	42,000	.003333	.001933	....	....	
10,750	43,000	.004133	.000800	....	....	
11,000	44,000	.005100	.000967	....	....	
11,250	45,000	.006033	.000933	.004433	.004333	
11,500	46,000	.007567	.001534	....	....	
11,750	47,000	.008267	.000700	....	....	
12,000	48,000	.009400	.001133	....	....	
12,250	49,000	.010400	.001000	....	....	
12,500	50,000	.011800	.001400	.010000	.005567	
12,750	51,000	.012633	.000833	....	....	
13,000	52,000	.013500	.000867	....	....	
13,250	53,000	.014900	.001400	....	....	
13,500	54,000	.016467	.001567	....	....	
13,750	55,000	.017700	.001233	....	....	
14,000	56,000	.019400	.001700	....	....	
14,250	57,000	.020667	.001267	....	....	
14,500	58,000	.022500	.001833	....	....	
14,750	59,000	.124267	.001767	....	....	
15,000	60,000	.026167	.001900	....	....	
15,500	62,000	.029700	.003533	....	....	
16,000	64,000	.034000	.004300	....	....	
16,500	66,000	.038667	.004667	....	....	
17,000	68,000	.044667	.006000	....	....	
17,500	70,000	.053000	.008333	....	....	
18,000	72,000	.061833	.008833	....	....	
18,500	74,000	.080000	.018167	....	....	
19,000	76,000	.1000	.0200	....	....	
19,300	77,200	.1467	.0467	....	....	Tensile strength.
15,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	77,200
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.2333
Elongation per inch under strain at elastic limit	do	.001400
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".9 from neck
Character of broken surface		silky
Elongation of inch sections		".44*, ".16, ".10

No. 932.

Marks, $\overset{8\,T_{9}}{M\,T_{1}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000133	.000133	0.	....	Initial load.
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
9,000	36,000	.001100	0.	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	Elastic limit.
12,000	48,000	.002167	.000700	....	....	
12,250	49,000	.002767	.000600	....	....	
12,500	50,000	.004067	.001300	.002267	....	
12,750	51,000	.004433	.000366	....	....	
13,000	52,000	.005333	.000900	....	....	
13,250	53,000	.006333	.001000	....	....	
13,500	54,000	.007400	.001067	....	....	
13,750	55,000	.008600	.001200	....	....	
14,000	56,000	.009667	.001067	....	....	
14,250	57,000	.010667	.001000	....	....	
14,500	58,000	.011667	.001000	....	....	
14,750	59,000	.012700	.001033	....	....	
15,000	60,000	.013867	.001167	....	....	
15,500	62,000	.016333	.002466	....	....	
16,000	64,000	.018600	.002267	....	....	
16,500	66,000	.021000	.002400	....	....	
17,000	68,000	.024500	.003500	....	....	
17,500	70,000	.028000	.003500	....	....	
18,000	72,000	.033000	.005000	....	....	
18,500	74,000	.036667	.003667	....	....	
19,000	76,000	.041333	.004666	....	....	
19,500	78,000	.046667	.005334	....	....	
20,000	80,000	.053667	.007000	....	....	
20,500	82,000	.063333	.009666	....	....	
21,000	84,000	.079667	.016334	....	....	
21,320	85,280	.1067	.027033	....	....	Tensile strength.
18,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8563
Hardness		12.03
Tensile strength per square inch of original section	pounds	85,280
Elastic limit per square inch of original section	do	47,000
Elongation per inch after rupture	inch	0.1833
Elongation per inch under strain at elastic limit	do	.001467
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.5 from middle of stem
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch section		″.20, ″.26*, ″.09

No. 933.

Marks, $\overset{8\ T_9}{M\ T,O}$
Diameter, ***".564.***
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	.000033	.000033	
6,250	25,000	.000767	.000167	.000033	0.	
7,500	30,000	.000933	.000166	.000033	0.	
8,750	35,000	.001100	.000167	.000067	.000034	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001233	0.	.000067	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	Elastic limit.
11,250	45,000	.001567	.000200	.000233	.000166	
11,500	46,000	.003767	.002200	....	....	
11,750	47,000	.004767	.001000	....	....	
12,000	48,000	.005767	.001000	....	....	
12,250	49,000	.006733	.000966	....	....	
12,500	50,000	.007733	.001000	.006067	.005834	
12,750	51,000	.008400	.000667	....	....	
13,000	52,000	.009400	.001000	....	....	
13,250	53,000	.010400	.001000	....	....	
13,500	54,000	.011667	.001267	....	....	
13,750	55,000	.013000	.001333	....	....	
14,000	56,000	.014000	.001000	....	....	
14,250	57,000	.015333	.001333	....	....	
14,500	58,000	.016600	.001267	....	....	
14,750	50,000	.017733	.001133	....	....	
15,000	60,000	.019000	.001267	....	....	
15,500	62,000	.022167	.003167	....	....	
16,000	64,000	.025267	.003100	....	....	
16,500	66,000	.028500	.003233	....	....	
17,000	68,000	.032000	.003500	....	....	
17,500	70,000	.035333	.003333	....	....	
18,000	72,000	.039667	.004334	....	....	
18,500	74,000	.046333	.006666	....	....	
19,000	76,000	.052900	.006567	....	....	
19,500	78,000	.060500	.007600	....	....	
20,000	80,000	.073000	.012500	....	....	
20,500	82,000	.0967	.0247	....	....	
20,770	83,080	.1467	.0500	....	....	Tensile strength.
17,700	....	- - - - - - - -	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 83,080
Elastic limit per square inch of original section ....do.... 44,000
Elongation per inch after rupture ....inch.. 0.2333
Elongation per inch under strain at elastic limit ....do.... .001367
Reduction in diameter at point of rupture ....do.... .164
Reduction in area after rupture, per centum of original section 40.7
Position of rupture .... ".9 from neck
Character of broken surface ....fine, silky
Elongation of inch sections .... ".41*, ".17, ".12

No. 934.

Marks, $\overset{ST}{M\,T_s\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000267	.000134	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	.000033	.000033	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	.000033	0.	
10, 250	41, 000	.001333	.000066	....	....	
10, 500	42, 000	.001367	.000034	....	....	
10, 750	43, 000	.001400	.000033	....	....	Elastic limit.
11, 000	44, 000	.001567	.000167	....	....	
11, 250	45, 000	.002767	.001200	.001400	.001367	
11, 500	46, 000	.004933	.002166	....	....	
11, 750	47, 000	.005933	.001000	....	....	
12, 000	48, 000	.006933	.001000	....	....	
12, 250	49, 000	.007833	.000900	....	....	
12, 500	50, 000	.009000	.001167	.007133	.005733	
12, 750	51, 000	.009767	.000767	....	....	
13, 000	52, 000	.010600	.000833	....	....	
13, 250	53, 000	.011367	.000767	....	....	
13, 500	54, 000	.012333	.000966	....	....	
13, 750	55, 000	.013600	.001267	....	....	
14, 000	56, 000	.015000	.001400	....	....	
14, 250	57, 000	.016200	.001200	....	....	
14, 500	58, 000	.017467	.001267	....	....	
14, 750	59, 000	.018700	.001233	....	....	
15, 000	60, 000	.020233	.001533	....	....	
15, 500	62, 000	.023167	.002934	....	....	
16, 000	64, 000	.026167	.003000	....	....	
16, 500	66, 000	.029500	.003333	....	....	
17, 000	68, 000	.033833	.004333	....	....	
17, 500	70, 000	.038167	.004334	....	....	
18, 000	72, 000	.042833	.004666	....	....	
18, 500	74, 000	.049333	.006500	....	....	
19, 000	76, 000	.060200	.010867	....	....	
19, 500	78, 000	.073000	.012800	....	....	
20, 000	80, 000	.0933	.0203	....	....	
20, 360	81, 440	.1400	.0467	....	....	Tensile strength.
17, 700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per inch of original section	pounds..	81, 440
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 2233
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		".8 from neck
Character of broken surface		silky
Elongation of inch sections		".41*, ".15, ".11

TUBE No. 30.—8″ *Converted Rifle.*

No. 942.

Marks, $\genfrac{}{}{0pt}{}{8\ T_{30}}{B\ T_1 I}$
Diameter, ″.564.
Sectional **area,** .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,200	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	.000033	.000033	
8,750	35,000	.001067	.000134	.000033	0.	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001167	.000067	....	....	
9,500	38,000	.001233	.000066	....	....	
9,750	39,000	.001300	.000067	....	....	Elastic limit.
10,000	40,000	.001467	.000167	.000267	.000234	
10,250	41,000	.002100	.000633	....	....	
10,500	42,000	.002667	.000567	....	....	
10,750	43,000	.003700	.001033	....	....	
11,000	44,000	.005233	.001533	....	....	
11,250	45,000	.006133	.000900	.004567	.004300	
11,500	46,000	.007767	.001634	....	....	
11,750	47,000	.008600	.000833	....	....	
12,000	48,000	.010000	.001400	....	....	
12,250	49,000	.011233	.001233	....	....	
12,500	50,000	.012633	.001400	.010767	.006200	
12,750	51,000	.013267	.000634	....	....	
13,000	52,000	.014400	.001133	....	....	
13,250	53,000	.015933	.001533	....	....	
13,500	54,000	.017900	.001967	....	....	
13,750	55,000	.019500	.001600	....	....	
14,000	56,000	.021200	.001700	....	....	
14,250	57,000	.022767	.001567	....	....	
14,500	58,000	.024767	.007000	....	....	
14,750	59,000	.026400	.001633	....	....	
15,000	60,000	.028667	.002267	....	....	
15,500	62,000	.033000	.004333	....	....	
16,000	64,000	.039433	.006433	....	....	
16,500	66,000	.045000	.005567	....	....	
17,000	68,000	.053000	.008000	....	....	
17,500	70,000	.063333	.010333	....	....	
18,000	72,000	.0867	.023367	....	....	
18,500	74,000	.1300	.0433	....	....	
18,600	74,400	.1600	.0300	....	....	Tensile strength.
15,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8601
Hardness		12.78
Tensile strength, per square inch of original section	pounds	74,400
Elastic limit, per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.2333
Elongation per inch under strain at elastic limit	do	.001300
Reduction in diameter at point of rupture	do	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		″.65 from neck
Character of broken surface		silky
Elongation of inch sections		″.42*, ″.18, ″.15

No. 943.

Marks, $\substack{8\,T_{30}\\ B\,T_{3}\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	Elastic limit.
9,750	39,000	.001200	.000067	....	....	
10,000	40,000	.002233	.000033	.000933	.000933	
10,250	41,000	.003400	.001167	....	....	
10,500	42,000	.004533	.001133	....	....	
10,750	43,000	.005567	.001034	....	....	
11,000	44,000	.006600	.001033	....	....	
11,250	45,000	.007767	.001167	000233	.005300	
11,500	46,000	.009500	.001733	....	....	
11,750	47,000	.009833	.000333	....	....	
12,000	48,000	.010967	.001134	....	....	
12,250	49,000	.012600	.001633	....	....	
12,500	50,000	.013833	.001233	.012067	.005834	
12,750	51,000	.014700	.000867	....	....	
13,000	52,000	.015600	.000900	....	....	
13,250	53,000	.016733	.001133	....	....	
13,500	54,000	.018700	.001967	....	....	
13,750	55,000	.020267	.001567	....	....	
14,000	56,000	.021900	.001633	....	....	
14,250	57,000	.023433	.001533	....	....	
14,500	58,000	.025233	.001800	....	....	
14,750	59,000	.026667	.001434	....	....	
15,000	60,000	.028900	.002233	....	....	
15,500	62,000	.033167	.004267	....	....	
16,000	64,000	.039567	.006400	....	....	
16,500	66,000	.045000	.005433	....	....	
17,000	68,000	.052833	.007833	....	....	
17,500	70,000	.061667	.008834	....	....	
18,000	72,000	.071833	.010166	....	....	
18,500	74,000	.0967	.024867	....	....	
18,810	75,240	.1433	.0466	....	....	Tensile strength.
15,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	75,240
Elastic limit per square inch of original section	do	38,000
Elongation per inch after rupture	inch	0.2267
Elongation per inch under strain at elastic limit	do	.001133
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.75 from neck
Character of broken surface		silky
Elongation of inch sections		″.44, ″.14, ″.10

No. 944.

Marks $^{8\,T_{30}}_{B\,T_{3}\,M}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	0.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000533	.000133	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000867	.000200	0.	....	
8,750	35,000	.001033	.000166	.000033	.000033	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001133	.000066	....	....	Elastic limit.
9,500	38,000	.001300	.000167	....	....	
9,750	39,000	.002267	.000967	....	....	
10,000	40,000	.003367	.001100	.001967	.001934	
10,250	41,000	.004200	.000833	....	....	
10,500	42,000	.005433	.001233	....	....	
10,750	43,000	.005933	.000500	....	....	
11,000	44,000	.007433	.001500	....	....	
11,250	45,000	.008400	.000967	.006933	.004966	
11,500	46,000	.010167	.001767	....	....	
11,750	47,000	.010733	.000566	....	....	
12,000	48,000	.012000	.001267	....	....	
12,250	49,000	.013267	.001267	....	....	
12,500	50,000	.014500	.001233	.012600	.005667	
12,750	51,000	.015600	.001100	....	....	
13,000	52,000	.001693	.001333	....	....	
13,250	53,000	.018333	.001400	....	....	
13,500	54,000	.020000	.001667	....	....	
13,750	55,000	.021800	.001800	....	....	
14,000	56,000	.023467	.001667	....	....	
14,250	57,000	.025133	.001666	....	....	
14,500	58,000	.027133	.002000	....	....	
14,750	59,000	.028800	.001667	....	....	
15,000	60,000	.033467	.004667	....	....	
15,500	62,000	.037600	.004133	....	....	
16,000	64,000	.042267	.004667	....	....	
16,500	66,000	.048967	.006700	....	....	
17,000	68,000	.058167	.009200	....	....	
17,500	70,000	.069500	.011333	....	....	
18,000	72,000	.0900	.0205	....	....	
18,500	74,000	.1233	.0333	....	....	
18,640	74,560	.1633	.0400	....	....	Tensile strength.
15,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength	pounds..	74,560
Elastic limit, per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.2700
Elongation per inch under strain at elastic limit	do....	.001133
Reduction in diameter at point of rupture	do....	.193
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		″.75 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.42*, ″.25, ″.14

No. 945.

Marks, $\overset{8\ T_{8}}{M\ T_{1}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001033	.000133	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001200	.000033	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001333	.000066	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001367	0.	0.	....	
11,500	46,000	.001400	.000033	....	....	Elastic limit.
11,750	47,000	.001533	.000133	....	....	
12,000	48,000	.003333	.001800	....	....	
12,250	49,000	.005833	.002500	....	....	
12,500	50,000	.007067	.001234	.005367	.005367	
12,750	51,000	.008400	.001333	....	....	
13,000	52,000	.009300	.000900	....	....	
13,250	53,000	.010400	.001100	....	....	
13,500	54,000	.011733	.001333	....	....	
13,750	55,000	.012733	.001000	....	....	
14,000	56,000	.014200	.001467	....	....	
14,250	57,000	.015967	.001767	....	....	
14,500	58,000	.018567	.002600	....	....	
14,750	59,000	.020500	.001933	....	....	
15,000	60,000	.021633	.001133	....	....	
15,500	62,000	.024000	.002367	....	....	
16,000	64,000	.027667	.003667	....	....	
16,500	66,000	.031833	.004166	....	....	
17,000	68,000	.036833	.005000	....	....	
17,500	70,000	.042833	.006000	....	....	
18,000	72,000	.048733	.005900	....	....	
18,500	74,000	.058667	.009934	....	....	
19,000	76,000	.070000	.011333	....	....	
19,500	78,000	.0967	.0267	....	....	
19,820	79,280	.1567	.0600	....	....	Tensile strength.

General summary.

Specific gravity	7.8564
Hardness	14.06
Tensile strength per square inch of original section .... pounds..	79,280
Elastic limit, per square inch of original section .... do ...	46,000
Elongation per inch after rupture .... inch..	0.2267
Elongation per inch under strain at elastic limit .... do....	.001400
Reduction in diameter at point of rupture .... do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	″.37 from middle of stem, oblique
Character of broken surface	granular 50 per cent.; silky, 50 per cent.
Elongation of inch sections	″.19, ″.34*, ″.15

No. 946.

Marks, $\overset{8\,T*}{MT\,,O}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001333	.000066	....	....	Elastic limit.
10,750	43,000	.001467	.000134	....	....	
11,000	44,000	.004233	.002766	....	....	
11,250	45,000	.005300	.001067	.003733	.003783	
11,500	46,000	.006600	.001300	....	....	
11,750	47,000	.007167	.000567	....	....	
12,000	48,000	.008167	.001000	....	....	
12,250	49,000	.009300	.001133	....	....	
12,500	50,000	.010867	.001067	.008467	.004734	
12,750	51,000	.011167	.000800	....	....	
13,000	52,000	.012600	.001433	....	....	
13,250	53,000	.013333	.000733	....	....	
13,500	54,000	.015600	.001667	....	....	
13,750	55,000	.016533	.001538	....	....	
14,000	56,000	.017833	.001300	....	....	
14,250	57,000	.019033	.001200	....	....	
14,500	58,000	.020233	.001200	....	....	
14,750	59,000	.021400	.001167	....	....	
15,000	60,000	.023333	.001933	....	....	
15,500	62,000	.027067	.003734	....	....	
16,000	64,000	.030667	.003600	....	....	
16,500	66,000	.034700	.004033	....	....	
17,000	68,000	.138000	.003300	....	....	
17,500	70,000	.043333	.005333	....	....	
18,000	72,000	.050000	.006667	....	....	
18,500	74,000	.060333	.010333	....	....	
19,000	76,000	.072167	.011834	....	....	
19,500	78,000	.0933	.021133	....	....	
19,910	79,640	.1433	.0500	....	....	Tensile strength.
17,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,640
Elastic limit per square inch of original section	do...	42,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do...	.001333
Reduction in diameter at point of rupture	do...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".5 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".19, ".38*, ".15

No. 947.

Marks, $\overset{8\ T_{10}}{M\ T_{3}\ M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000783	.000183	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001067	0.	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001200	.000033	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001300	.000067	....	....	Elastic limit.
10,750	43,000	.001533	.000233	....	....	
11,000	44,000	.002633	.001100	....	....	
11,250	45,000	.003467	.000834	.001933	.001933	
11,500	46,000	.005233	.001766	....	....	
11,750	47,000	.005900	.000667	....	....	
12,000	48,000	.006900	.001000	....	....	
12,250	49,000	.007800	.000900	....	....	
12,500	50,000	.009233	.001433	.007400	.005467	
12,750	51,000	.009933	.000700	....	....	
13,000	52,000	.010867	.000934	....	....	
13,250	53,000	.011800	.000933	....	....	
13,500	54,000	.013333	.001533	....	....	
13,750	55,000	.014500	.001167	....	....	
14,000	56,000	.015933	.001433	....	....	
14,250	57,000	.017067	.001134	....	....	
14,500	58,000	.018333	.001266	....	....	
14,750	59,000	.019833	.001500	....	....	
15,000	60,000	.021500	.001667	....	....	
15,500	62,000	.025000	.003500	....	....	
16,000	64,000	.028833	.003833	....	....	
16,500	66,000	.032333	.003500	....	....	
17,000	68,000	.036667	.004334	....	....	
17,500	70,000	.042167	.005500	....	....	
18,000	72,000	.048333	.006166	....	....	
18,500	74,000	.057500	.009167	....	....	
19,000	76,000	.068333	.010833	....	....	
19,500	78,000	.0900	.021667	....	....	
19,810	79,240	.1333	.0433	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,240
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		".7 from middle of stem
Character of broken surface		granular, 50 per cent.; silky, 50 per cent.
Elongation of inch sections		".31*, ".17, ".09

TUBE No. 31.—8″ *Converted Rifle.*

No. 824.

Marks, $\overset{S\ T_{n}}{B\ T_{1}\ I}$
Diameter, ″.564.
Sectional **area, .25 square inch.**

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	—.000033	—.000033	
2,500	10,000	.000133	.000133	—.000033	0.	
3,750	15,000	.000300	.000167	—.000033	0.	
5,000	20,000	.000467	.000167	—.000033	0.	
6,250	25,000	.000633	.000166	—.000033	0.	
7,500	30,000	.000800	.000167	—.000033	0.	
8,750	35,000	.001033	.000233	—.000033	0.	Elastic limit.
9,000	36,000	.001367	.000334	....	....	
9,250	37,000	.001967	.000600	....	....	
9,500	38,000	.002933	.000966	....	....	
9,750	39,000	.003500	.000567	....	....	
10,000	40,000	.004900	.001400	.003600	.003633	
10,250	41,000	.005733	.000833	....	....	
10,500	42,000	.006667	.000934	....	....	
10,750	43,000	.001067	.001000	....	....	
11,000	44,000	.009367	.001700	....	....	
11,250	45,000	.010467	.001100	.008933	.005333	
11,500	46,000	.012000	.001533	....	....	
11,750	47,000	.013200	.001200	....	....	
12,000	48,000	.014600	.001400	....	....	
12,250	49,000	.015833	.001233	....	....	
12,500	50,000	.017533	.001700	.015700	.006767	
12,750	51,000	.019000	.001467	....	....	
13,000	52,000	.020333	.001333	....	....	
13,250	53,000	.021067	.001334	....	....	
13,500	54,000	.023833	.002166	....	....	
13,750	55,000	.025667	.001834	....	....	
14,000	56,000	.028000	.002333	....	....	
14,250	57,000	.030000	.002000	....	....	
14,500	58,000	.032667	.002667	....	....	
14,750	59,000	.034667	.002000	....	....	
15,000	60,000	.037833	.003166	....	....	
15,500	62,000	.043733	.005900	....	....	
16,000	64,000	.051667	.007934	....	....	
16,500	66,000	.063333	.011666	....	....	
17,000	68,000	.078000	.014667	....	....	
17,500	70,000	.0933	.0153	....	....	
18,000	72,000	.1333	.0400	....	....	
18,060	72,240	.1667	.0834	....	....	Tensile strength.
15,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8618
Hardness	11.33
Tensile strength per square inch of original section .... pounds..	72,240
Elastic limit per square inch of original section .... do....	35,000
Elongation per inch after rupture .... inch..	0.2600
Elongation per inch under strain at elastic limit .... do....	.001033
Elongation per inch at point of rupture .... do...,	.134
Reduction in diameter after rupture, per centum of original section	41.9
Reduction in area	
Position of rupture	1″ from neck oblique
Character of broken surface	dull, silky
Elongation of inch sections	″.26*, ″.23, ″.19

No. 825.

Marks, $\overset{8\,T_{11}}{B\,T_{2}\,O}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000733	.000166	.000033	.000033	
7,500	30,000	.000900	.000167	.000033	0.	
8,750	35,000	.001100	.000200	.000100	.000067	Elastic limit.
9,000	36,000	.001367	.000267			
9,250	37,000	.001800	.000433			
9,500	38,000	.002900	.001100			
9,750	39,000	.003733	.000833			
10,000	40,000	.004733	.001000	.003433	.003333	
10,250	41,000	.005767	.001034			
10,500	42,000	.006933	.001166			
10,750	43,000	.007800	.000867			
11,000	44,000	.009067	.001267			
11,250	45,000	.010167	.001100	.008467	.005034	
11,500	46,000	.011333	.001166			
11,750	47,000	.012267	.000934			
12,000	48,000	.013933	.001666			
12,250	49,000	.015033	.001100			
12,500	50,000	.016733	.001700	.014667	.006200	
12,750	51,000	.017667	.000934			
13,000	52,000	.019167	.001500			
13,250	53,000	.020833	.001666			
13,500	54,000	.022467	.001634			
13,750	55,000	.023933	.001466			
14,000	56,000	.026100	.002167			
14,250	57,000	.028000	.001900			
14,500	58,000	.030233	.002233			
14,750	59,000	.032000	.001767			
15,000	60,000	.034667	.002667			
15,500	62,000	.039667	.005000			
16,000	64,000	.046667	.007000			
16,500	66,000	.053333	.006666			
17,000	68,000	.063333	.010000			
17,500	70,000	.075833	.012500			
18,000	72,000	.095000	.019167			
18,500	74,000	.1400	.0450			
18,520	74,080	.1700	.0300			Tensile strength.
16,100						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	74,080
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.2667
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.143
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.50 from middle of stem, oblique
Character of broken surface		dull, silky
Elongation of inch sections		″.22, ″.41^{b}, ″.17

TUBE No. 31.—8″ *Converted Rifle.*

No. 824.

Marks, $^{8\ \mathrm{Tn}}_{\mathrm{B\ T_1\ I}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	—.000033	—.000033	
2,500	10,000	.000133	.000133	—.000033	0.	
3,750	15,000	.000300	.000167	—.000033	0.	
5,000	20,000	.000467	.000167	—.000033	0.	
6,250	25,000	.000633	.000166	—.000033	0.	
7,500	30,000	.000800	.000167	—.000033	0.	
8,750	35,000	.001033	.000233	—.000033	0.	Elastic limit.
9,000	36,000	.001367	.000334	....	....	
9,250	37,000	.001967	.000600	....	....	
9,500	38,000	.002933	.000966	....	....	
9,750	39,000	.003500	.000567	....	....	
10,000	40,000	.004900	.001400	.003600	.003633	
10,250	41,000	.005733	.000833	....	....	
10,500	42,000	.006667	.000934	....	....	
10,750	43,000	.001667	.001000	....	....	
11,000	44,000	.009367	.001700	....	....	
11,250	45,000	.010467	.001100	.008933	.005333	
11,500	46,000	.012000	.001533	....	....	
11,750	47,000	.013200	.001200	....	....	
12,000	48,000	.014600	.001400	....	....	
12,250	49,000	.015833	.001233	....	....	
12,500	50,000	.017533	.001700	.015700	.006767	
12,750	51,000	.019000	.001467	....	....	
13,000	52,000	.020333	.001333	....	....	
13,250	53,000	.021667	.001334	....	....	
13,500	54,000	.023833	.002166	....	....	
13,750	55,000	.025667	.001834	....	....	
14,000	56,000	.028000	.002333	....	....	
14,250	57,000	.030000	.002000	....	....	
14,500	58,000	.032667	.002667	....	....	
14,750	59,000	.034667	.002000	....	....	
15,000	60,000	.037833	.003166	....	....	
15,500	62,000	.043733	.005900	....	....	
16,000	64,000	.051667	.007934	....	....	
16,500	66,000	.063333	.011666	....	....	
17,000	68,000	.078000	.014667	....	....	
17,500	70,000	.0933	.0153	....	....	
18,000	72,000	.1333	.0400	....	....	
18,060	72,240	.1667	.0334	....	....	Tensile strength.
15,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8618
Hardness		11.33
Tensile strength per square inch of original section	pounds..	72,240
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.2600
Elongation per inch under strain at elastic limit	do....	.001033
Reduction in diameter at point of rupture	do....,	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck oblique
Character of broken surface		dull, silky
Elongation of inch sections		″.26*, ″.23, ″.19

No. 827.

Marks, $\overset{8\ T_{8}}{M\ T_{1}\ I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000767	.000134	0.	....	
7,500	30,000	.000967	.000200	.000033	.000033	
8,750	35,000	.001133	.000166	.000067	.000034	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000067	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001433	.000100	....	....	Elastic limit.
10,750	43,000	.001633	.000200	....	....	
11,000	44,000	.002000	.000367	....	....	
11,250	45,000	.002467	.000467	.001000	.000933	
11,500	46,000	.003333	.000866	....	....	
11,750	47,000	.003867	.000534	....	....	
12,000	48,000	.004867	.001000	....	....	
12,250	49,000	.005867	.001000	....	....	
12,500	50,000	.007000	.001133	.005200	.004200	
12,750	51,000	.007800	.000800	....	....	
13,000	52,000	.008700	.000900	....	....	
13,250	53,000	.009800	.001100	....	....	
13,500	54,000	.011200	.001400	....	....	
13,750	55,000	.012367	.001167	....	....	
14,000	56,000	.013367	.001000	....	....	
14,250	57,000	.014833	.001466	....	....	
14,500	58,000	.015967	.001134	....	....	
14,750	59,000	.017167	.001200	....	....	
15,000	60,000	.018500	.001333	....	....	
15,500	62,000	.021000	.002500	....	....	
16,000	64,000	.024333	.003333	....	....	
16,500	66,000	.028333	.004000	....	....	
17,000	68,000	.032000	.003667	....	....	
17,500	70,000	.036833	.004833	....	....	
18,000	72,000	.041333	.004500	....	....	
18,500	74,000	.047167	.005834	....	....	
19,000	76,000	.054667	.007500	....	....	
19,500	78,000	.065833	.011166	....	....	
20,000	80,000	.080000	.014167	....	....	
20,370	81,480	.1167	.0367	....	....	Tensile strength.

General summary.

Specific gravity		7.8555
Hardness		14.40
Tensile strength per square inch of original section	pounds..	81,480
Elastic limit per square inch of original section	do....	42,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic list	do....	.001433
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		″.8 from neck
Character of broken surface		granular 60 per cent., dull silky 40 per cent
Elongation of inch sections		″.21*, ″.11, ″.10

No. 828.

Marks, $^{8\ Tn}$M T$_3$ O
Diameter, ."564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks
Total.	Per square inch.					
Pounds.	Pounds.	Inch.	Inch.	Inch.	Inch.	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000600	.000167	0.		
6,250	25,000	.000767	.000167	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001067	.000134	0.		
9,000	36,000	.001100	.000033			
9,250	37,000	.001133	.000033			
9,500	38,000	.001167	.000034			
9,750	39,000	.001200	.000033			
10,000	40,000	.001233	.000033	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			Elastic limit.
11,000	44,000	.001500	.000167			
11,250	45,000	.001667	.000167	.000233	.000233	
11,500	46,000	.002100	.000433			
11,750	47,000	.002600	.000500			
12,000	48,000	.003500	.000900			
12,250	49,000	.004167	.000667			
12,500	50,000	.005433	.001266	.003700	.003467	
12,750	51,000	.006033	.000600			
13,000	52,000	.007167	.001134			
13,250	53,000	.008000	.000833			
13,500	54,000	.009300	.001300			
13,750	55,000	.010167	.000867			
14,000	56,000	.011333	.001166			
14,250	57,000	.012367	.001034			
14,500	58,000	.013500	.001133			
14,750	59,000	.014667	.001167			
15,000	60,000	.015867	.001200			
15,500	62,000	.018533	.002666			
16,000	64,000	.022400	.003867			
16,500	66,000	.025400	.003000			
17,000	68,000	.028333	.002933			
17,500	70,000	.031733	.003400			
18,000	72,000	.036000	.004267			
18,500	74,000	.040833	.004833			
19,000	76,000	.046667	.005834			
19,500	78,000	.054000	.007333			
20,000	80,000	.063333	.009333			
20,500	82,000	.078333	.015000			
20,890	83,560	.1167	.038367			Tensile strengt
18,900						Load at time of r

General summary.

Tensile strength per square inch of original section..pound
Elastic limit per square inch of original section..do.
Elongation per inch after rupture..inc
Elongation per inch under strain at elastic limit..do.
Reduction in diameter at point of rupture..do.
Reduction in area after rupture, per centum of original section..
Position of rupture..".85
Character of broken surface..dull silky, slight
Elongation of inch sections..".28

No. 829.

Marks, $\overset{8}{M}\overset{T}{T},\overset{q}{M}$
Diameter, ″.563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000267	.000134	0.		
3,750	15,000	.000467	.000200	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001133	.000166	.000033	.000033	
9,000	36,000	.001233	.000100			
9,250	37,000	.001267	.000034			
9,500	38,000	.001300	.000033			
9,750	39,000	.001367	.000067			
10,000	40,000	.001433	.000066	.000133	.000100	Elastic limit.
10,250	41,000	.001967	.000534			
10,500	42,000	.003733	.001766			
10,750	43,000	.005267	.001534			
11,000	44,000	.006400	.001133			
11,250	45,000	.007267	.000867	.005567	.005434	
11,500	46,000	.008400	.001133			
11,750	47,000	.009167	.000767			
12,000	48,000	.010400	.001233			
12,250	49,000	.011367	.000967			
12,500	50,000	.012967	.001600	.010967	.005400	
12,750	51,000	.013600	.000633			
13,000	52,000	.015000	.001400			
13,250	53,000	.015933	.000933			
13,500	54,000	.017533	.001600			
13,750	55,000	.019200	.001667			
14,000	56,000	.020600	.001400			
14,250	57,000	.022033	.001433			
14,500	58,000	.023667	.001634			
14,750	59,000	.025333	.001666			
15,000	60,000	.027167	.001834			
15,500	62,000	.031200	.004033			
16,000	64,000	.036333	.005133			
16,500	66,000	.042000	.005667			
17,000	68,000	.047667	.005667			
17,500	70,000	.055500	.007833			
18,000	72,000	.066000	.010500			
18,500	74,000	.080000	.014000			
19,000	76,000	.1100	.0300			
19,180	76,720	.1533	.0433			Tensile strength.
17,700						Load at time of rupture.

General summary.

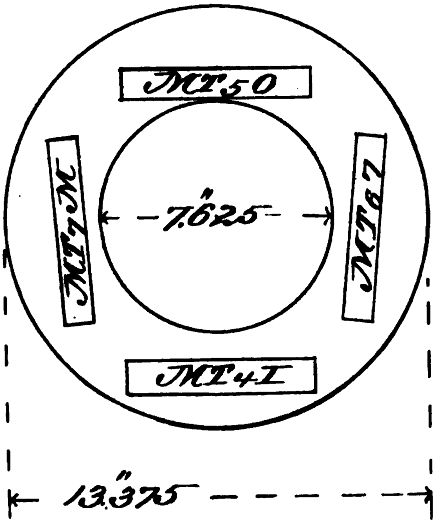
Tensile strength per square inch of original section	pounds	76,720
Elastic limit per square inch of original section	do	40,000
Elongation per inch after rupture	inch	0.2267
Elongation per inch under strain at elastic limit	do	.001433
Reduction in diameter at point of rupture	do	.133
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.35 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.17, ″.36*, ″.15

8" Converted Rifle

Tube No. 31

Additional specimens

Muzzle



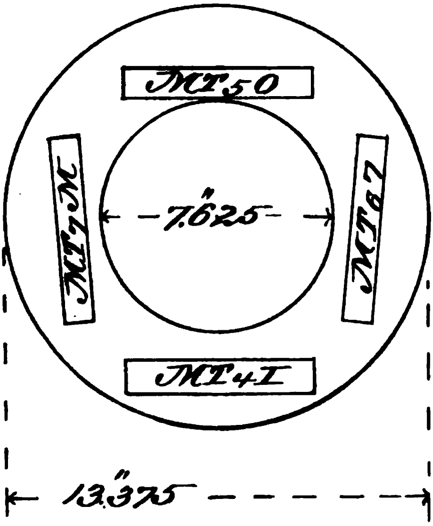
S Ex 36 49 1

8' Converted Rifle

Tube No. 31

Additional specimens

Muzzle



No. 953.

Marks, $\overset{8\ \mathrm{T_{II}}}{\mathrm{M\ T_{8}O}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000267	.000200	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000600	.000200	0.	....	
6, 250	25, 000	.000733	.000133	0.	....	
7, 500	30, 000	.000933	.000200	0.	....	
8, 750	35, 000	.001067	.000134	0.	....	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001100	0.	....	....	
9, 500	38, 000	.001133	.000033	....	....	
9, 750	39, 000	.001167	.000034	....	....	
10, 000	40, 000	.001233	.000066	.000033	.000033	
10, 250	41, 000	.001300	.000067	....	....	Elastic limit.
10, 500	42, 000	.003167	.001867	....	....	
10, 750	43, 000	.004133	.000966	....	....	
11, 000	44, 000	.005367	.001234	....	....	
11, 250	45, 000	.006467	.001100	.004800	.004767	
11, 500	46, 000	.007433	.000966	....	....	
11, 750	47, 000	.008100	.000667	....	....	
12, 000	48, 000	.009500	.001400	....	....	
12, 250	49, 000	.010400	.000900	....	....	
12, 500	50, 000	.011933	.001533	.010033	.005233	
12, 750	51, 000	.012733	.000800	....	....	
13, 000	52, 000	.013933	.001200	....	....	
13, 250	53, 000	.015167	.001234	....	....	
13, 500	54, 000	.016667	.001500	....	....	
13, 750	55, 000	.018267	.001600	....	....	
14, 000	56, 000	.020000	.001733	....	....	
14, 250	57, 000	.021333	.001333	....	....	
14, 500	58, 000	.022833	.001500	....	....	
14, 750	59, 000	.024500	.001667	....	....	
15, 000	60, 000	.026667	.002167	....	....	
15, 500	62, 000	.030000	.003333	....	....	
16, 000	64, 000	.034000	.004000	....	....	
16, 500	66, 000	.039333	.005333	....	....	
17, 000	68, 000	.045667	.006334	....	....	
17, 500	70, 000	.056000	.010333	....	....	
18, 000	72, 000	.0633	.0073	....	....	
18, 500	74, 000	.0767	.0134	....	....	
19, 000	76, 000	.0933	.0166	....	....	
19, 350	77, 400	.1500	.0567	....	....	Tensile strength.
17, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77, 400
Elastic limit per square inch of original section	do....	41, 000
Elongation per inch after rupture	inch..	0. 2300
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47. 2
Position of rupture		″.5 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.27*, ″.30*, ″.12

No. 954.

Marks, $M\overset{8\ Tn}{T_c M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000067	.000034	
5,000	20,000	.000667	.000167	.000067	0.	
6,250	25,000	.000833	.000166	.000067	0.	
7,500	30,000	.001000	.000167	.000100	.000033	
8,750	35,000	.001167	.000167	.000100	0.	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001267	.000067	....	....	
9,500	38,000	.001300	.000033	....	....	
9,750	39,000	.001367	.000067	....	....	Elastic limit.
10,000	40,000	.001600	.000233	.000300	.000200	
10,250	41,000	.001933	.000333	....	....	
10,500	42,000	.005100	.003167	....	....	
10,750	43,000	.005933	.000833	....	....	
11,000	44,000	.007233	.001300	....	....	
11,250	45,000	.008767	.001534	.007067	.006767	
11,500	46,000	.009333	.000566	....	....	
11,750	47,000	.010000	.000667	....	....	
12,000	48,000	.011333	.001333	....	....	
12,250	49,000	.012167	.000834	....	....	
12,500	50,000	.013733	.001566	.011867	.004800	
12,750	51,000	.015000	.001267	....	....	
13,000	52,000	.016167	.001167	....	....	
13,250	53,000	.017400	.001233	....	....	
13,500	54,000	.019067	.001667	....	....	
13,750	55,000	.020733	.001666	....	....	
14,000	56,000	.022133	.001400	....	....	
14,250	57,000	.023600	.001467	....	....	
14,500	58,000	.025500	.001900	....	....	
14,750	59,000	.027067	.001567	....	....	
15,000	60,000	.029167	.002100	....	....	
15,500	62,000	.033400	.004233	....	....	
16,000	64,000	.038000	.004600	....	....	
16,500	66,000	.044000	.006000	....	....	
17,000	68,000	.050667	.006667	....	....	
17,500	70,000	.058833	.008166	....	....	
18,000	72,000	.072667	.013834	....	....	
18,500	74,000	.0967	.024033	....	....	
19,000	76,000	.1467	.0500	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds	76,000
Elastic limit, per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.2200
Elongation per inch under strain at elastic limit	do	.001367
Elongation per inch in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.65 from middle of stem
Character of broken surface		granular 80 per cent., dull silky spot 20 per cent
Elongation of inch sections		″28*, ″.19, ″.19

No. 955.

Marks, $\overset{8\ \mathrm{T_n}}{\mathrm{M\ T,M}}$
Diameter, .″564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000067	.000034	
6,250	25,000	.000833	.000166	.000067	0.	
7,500	30,000	.001000	.000167	.000100	.000033	
8,750	35,000	.001167	.000167	.000100	0.	
9,000	36,000	.001200	.000033	....	....	
9,250	37,000	.001233	.000033	....	....	
9,500	38,000	.001267	.000034	....	....	
9,750	39,000	.001333	.000066	....	....	Elastic limit.
10,000	40,000	.001567	.000234	.000267	.000167	
10,250	41,000	.002267	.000700	....	....	
10,500	42,000	.003333	.001066	....	....	
10,750	43,000	.005067	.001734	....	....	
11,000	44,000	.006167	.001100	....	....	
11,250	45,000	.007167	.001000	.005600	.005333	
11,500	46,000	.008667	.001500	....	....	
11,750	47,000	.009400	.000733	....	....	
12,000	48,000	.010933	.001533	....	....	
12,250	49,000	.012000	.001067	....	....	
12,500	50,000	.013167	.001167	.011333	.005733	
12,750	51,000	.014000	.000833	....	....	
13,000	52,000	.015000	.001000	....	....	
13,250	53,000	.016667	.001667	....	....	
13,500	54,000	.018333	.001666	....	....	
13,750	55,000	.020000	.001667	....	....	
14,000	56,000	.021600	.001600	....	....	
14,250	57,000	.022733	.001133	....	....	
14,500	58,000	.024667	.001934	....	....	
14,750	59,000	.026167	.001500	....	....	
15,000	60,000	.028333	.002166	....	....	
15,500	62,000	.032500	.004167	....	....	
16,000	64,000	.037000	.004500	....	....	
16,500	66,000	.041667	.004667	....	....	
17,000	68,000	.049000	.007333	....	....	
17,500	70,000	.058333	.009333	....	....	
18,000	72,000	.070833	.012500	....	....	
18,500	74,000	.0900	.019167	....	....	
18,920	75,680	.1433	.0533	....	....	Tensile strength.
16,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	75,680
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.2133
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.62 from neck; oblique
Character of broken surface		silky
Elongation of inch sections		″.38*, ″14, ″.12

TUBE NO. 32.—8″ *Converted Rifle.*

No. 974.

Marks, $\overset{8\ T_n}{BT\ 1I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000333	.000200	0.	....	
3, 750	15, 000	.000467	.000134	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
9, 000	36, 000	.001133	0.	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001267	.000034	0.	....	
10, 250	41, 000	.001333	.000066	....	....	Elastic limit.
10, 500	42, 000	.001600	.000267	....	....	
10, 750	43, 000	.003600	.002000	....	....	
11, 000	44, 000	.005200	.001600	....	....	
11, 250	45, 000	.006300	.001100	.004533	.004533	
11, 500	46, 000	.007067	.000767	....	....	
11, 750	47, 000	.008100	.001033	....	....	
12, 000	48, 000	.009567	.001467	....	....	
12, 250	49, 000	.010567	.001000	....	....	
12, 500	50, 000	.011900	.001333	.010067	.005534	
12, 750	51, 000	.012400	.000500	....	....	
13, 000	52, 000	.013567	.001167	....	....	
13, 250	53, 000	.014933	.001366	....	....	
13, 500	54, 000	.016433	.001500	....	....	
13, 750	55, 000	.017667	.001234	....	....	
14, 000	56, 000	.019000	.001333	....	....	
14, 250	57, 000	.020400	.001400	....	....	
14, 500	58, 000	.022267	.001867	....	....	
14, 750	59, 000	.023433	.001166	....	....	
15, 000	60, 000	.025267	.001834	....	....	
15, 500	62, 000	.028567	.003300	....	....	
16, 000	64, 000	.032833	.004266	....	....	
16, 500	66, 000	.038500	.005667	....	....	
17, 000	68, 000	.044000	.005500	....	....	
17, 500	70, 000	.050667	.006667	....	....	
18, 000	72, 000	.058833	.008166	....	....	
18, 500	74, 000	.070500	.011667	....	....	
19, 000	76, 000	.0867	.0162	....	....	
19, 500	78, 000	.1467	.0600	....	....	Tensile strength.
16, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8540
Hardness		14.47
Tensile strength per square inch of original section	pounds..	78, 000
Elastic limit per square inch of original section	do ...	41, 000
Elongation per inch after rupture	inch..	0.2700
Elongation per inch under strain at elastic limit	do...	.001333
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.6 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.25, ″.30*, ″.17

No. 975.

Marks, $\genfrac{}{}{0pt}{}{8\ \mathrm{T_m}}{\mathrm{B\ T_2\ O}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000267	.000200	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	.000033	.000033	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001133	0.	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000033	0.	
10,250	41,000	.001267	.000034	....	....	Elastic limit.
10,500	42,000	.001400	.000133	....	....	
10,750	43,000	.001533	.000133	....	....	
11,000	44,000	.003800	.002267	....	....	
11,250	45,000	.004833	.001033	.005267	.005234	
11,500	46,000	.005600	.000767	....	....	
11,750	47,000	.006267	.000667	....	....	
12,000	48,000	.007333	.001066	....	....	
12,250	49,000	.008333	.001000	....	....	
12,500	50,000	.009500	.001167	.007600	.002333	
12,750	51,000	.010333	.000833	....	....	
13,000	52,000	.011167	.000834	....	....	
13,250	53,000	.012167	.001000	....	....	
13,500	54,000	.014033	.001866	....	....	
13,750	55,000	.015033	.001000	....	....	
14,000	56,000	.016233	.001200	....	....	
14,250	57,000	.017600	.001367	....	....	
14,500	58,000	.019167	.001567	....	....	
14,750	59,000	.020333	.001166	....	....	
15,000	60,000	.021667	.001334	....	....	
15,500	62,000	.024667	.003000	....	....	
16,000	64,000	.028333	.003666	....	....	
16,500	66,000	.032000	.003667	....	....	
17,000	68,000	.035500	.003500	....	....	
17,500	70,000	.040333	.004833	....	....	
18,000	72,000	.046667	.006334	....	....	
18,500	74,000	.054000	.007333	....	....	
19,000	76,000	.063333	.009333	....	....	
19,500	78,000	.0767	.013367	....	....	
20,000	80,000	.1000	.0233	....	....	
20,200	80,800	.1600	.0600	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	80,800
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2367
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		".45 from middle of stem
Character of broken surface		silky; trace of granular metal near circumference
Elongation of inch sections		".20, ".38, ".13

No. 976.

Marks, B $^{8\ Tm}_{T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000267	.000200	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001167	.000034	....	....	
9, 500	38, 000	.001200	.000033	....	....	
9, 750	39, 000	.001267	.000067	....	....	
10, 000	40, 000	.001333	.000066	0.	....	
10, 250	41, 000	.001367	.000034	....	....	
10, 500	42, 000	.001433	.000066	....	....	Elastic limit.
10, 750	43, 000	.001700	.000267	....	....	
11, 000	44, 000	.002967	.001267	....	....	
11, 250	45, 000	.003900	.000933	.002267	.002267	
11, 500	46, 000	.005133	.001233	....	....	
11, 750	47, 000	.005700	.000567	....	....	
12, 000	48, 000	.006600	.000900	....	....	
12, 250	49, 000	.007833	.001233	....	....	
12, 500	50, 000	.009000	.001167	.007100	.004833	
12, 750	51, 000	.009667	000667	....	....	
13, 000	52, 000	.010600	.000933	....	....	
13, 250	53, 000	.011600	.001000	....	....	
13, 500	54, 000	.012900	.001800	....	....	
13, 750	55, 000	.013900	.001000	....	....	
14, 000	56, 000	.015200	.001300	....	....	
14, 250	57, 000	.016533	.001333	....	....	
14, 500	58, 000	.017900	.001367	....	....	
14, 750	59, 000	.019167	.001267	....	....	
15, 000	60, 000	.020567	.001400	....	....	
15, 500	62, 000	.023500	.002933	....	....	
16, 000	64, 000	.026700	.003200	....	....	
16, 500	66, 000	.031167	.004467	....	....	
17, 000	68, 000	.035167	.004000	....	....	
17, 500	70, 000	.039733	.004566	....	....	
18, 000	72, 000	.045000	.005267	....	....	
18, 500	74, 000	.051667	.006667	....	....	
19, 000	76, 000	,060500	.008833	....	....	
19, 500	78, 000	.0767	.0162	....	....	
20, 000	80, 000	.1000	.0233	....	....	
20, 260	81, 040	.1567	.0567	....	....	Tensile strength.
18, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 81, 040
Elastic limit per square inch of original section..............do.... 42, 000
Elongation per inch after rupture ....inch.. 0. 2133
Elongation per inch under strain at elastic limit..............do.... .001433
Reduction in diameter at point of rupture..............do.... .114
Reduction in area after rupture, per centum of original section.............. 36. 4
Position of rupture..............″25 from neck
Character of broken surface ....granular, 60 per centum; silky, 40 per centum
Elongation of inch sections ....″.31*, ″.21, ″.12

No. 977.

Marks, $\frac{8\ \mathrm{Ts}}{\mathrm{M\ T_1\ I}}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000333	.000166	.000033	0.	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000033	0.	
6,250	25,000	.000833	.000166	.000033	0.	
7,500	30,000	.001000	.000167	.000033	0.	
8,750	35,000	.001167	.000167	.000033	0.	
9,000	36,000	.001167	0.	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001300	.000067	....	....	
10,000	40,000	.001367	.000067	.000067	.000034	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001433	.000033	....	....	Elastic limit.
10,750	43,000	.001600	.000167	....	....	
11,000	44,000	.002900	.001300	....	....	
11,250	45,000	.004233	.001333	.002633	.002566	
11,500	46,000	.005400	.001167	....	....	
11,750	47,000	.006233	.000833	....	....	
12,000	48,000	.007433	.001200	....	....	
12,250	49,000	.008767	.001334	....	....	
12,500	50,000	.010167	.001400	.008267	.005634	
12,750	51,000	.010833	.000666	....	....	
13,000	52,000	.011333	.000500	....	....	
13,250	53,000	.012600	.001267	....	....	
13,500	54,000	.013767	.001167	....	....	
13,750	55,000	.015000	.001233	....	....	
14,000	56,000	.016333	.001333	....	....	
14,250	57,000	.017333	.001000	....	....	
14 500	58,000	.018667	.001334	....	....	
14,750	59,000	.020000	.001333	....	....	
15,000	60,000	.021333	.001333	....	....	
15,500	62,000	.024833	.003500	....	....	
16,000	64,000	.027500	.002667	....	....	
16,500	66,000	.031000	.003500	....	....	
17,000	68,000	.035000	.004000	....	....	
17,500	70,000	.039500	.004500	....	....	
18,000	72,000	.046667	.007167	....	....	
18,500	74,000	.053500	.006833	....	....	
19,000	76,000	.063000	.009500	....	....	
19,500	78,000	.076000	.013000	....	....	
20,000	80,000	.1067	.0307	....	....	
20,210	80,840	.1483	.0366	....	....	Tensile strength.
19,600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8502
Hardness	15.18
Tensile strength per square inch of original section ...pounds..	80,840
Elastic limit per square inch of original section ...do....	42,000
Elongation per inch after rupture ...inch..	0.1733
Elongation per inch under strain at elastic limit...do....	.001433
Reduction in diameter at point of rupture...do....	.074
Reduction in area after rupture, per centum of original section	24.6
Position of rupture	".95 from neck
Character of broken surface	granular, radiating from a dull spot at circumference
Elongation of inch sections	".26*, ".15, ".12

No. 978.

Marks, $\overset{S\ Tm}{M\ T_2\ O}$
Diameter, ″.564.
***Sectional* area**, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000467	.000134	0.	....	
6,250	25,000	.000633	.000166	0.	....	
7,500	30,000	.000800	.000167	0.	....	
8,750	35,000	.000967	.000167	0.	....	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001100	.0	0.	....	
10,250	41,000	.001167	.000067	....	....	
10,500	42,000	.001233	.000066	....	....	
10,750	43,000	.001300	.000067	....	....	Elastic limit.
11,000	44,000	.002467	.001167	....	....	
11,250	45,000	.003400	.000933	.001800	.001800	
11,500	46,000	.004233	.000833	....	....	
11,750	47,000	.004900	.000667	....	....	
12,000	48,000	.006433	.001533	....	....	
12,250	49,000	.007233	.000800	....	....	
12,500	50,000	.009000	.001767	.007100	.005800	
12,750	51,000	.009667	.000667	....	....	
13,000	52,000	.010167	.000500	....	....	
13,250	53,000	.011167	.001000	....	....	
13,500	54,000	.012600	.001433	....	....	
13,750	55,000	.013767	.001167	....	....	
14,000	56,000	.015000	.001233	....	....	
14,250	57,000	.016400	.001400	....	....	
14,500	58,000	.017700	.001300	....	....	
14,750	59,000	.018933	.001233	....	....	
15,000	60,000	.020767	.001834	....	....	
15,500	62,000	.023667	.002900	....	....	
16,000	64,000	.027000	.003333	....	....	
16,500	66,000	.030500	.003500	....	....	
17,000	68,000	.034667	.004167	....	....	
17,500	70,000	.039667	.005000	....	....	
18,000	72,000	.045333	.005666	....	....	
18,500	74,000	.052667	.007334	....	....	
19,000	76,000	.061167	.008500	....	....	
19,500	78,000	.074000	.012833	....	....	
20,000	80,000	.1000	.0260	....	....	
20,180	80,720	.1367	.0367	....	....	Tensile strength.
18,100	------------	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,720
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.45 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		″.40*, ″.14, ″.09

No. 979.

Marks, $\overset{8\,T_m}{M\,T_2\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000300	.000133	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001133	0.	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001200	.000033	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001333	.000066	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001433	.000066	....	....	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001533	.000066	....	....	Elastic limit.
12,000	48,000	.001900	.000367	....	....	
12,250	49,000	.002600	.000700	....	....	
12,500	50,000	.003900	.001300	.002200	.002200	
12,750	51,000	.004767	.000867	....	....	
13,000	52,000	.005667	.000900	....	....	
13,250	53,000	.006767	.001100	....	....	
13,500	54,000	.008267	.001500	....	....	
13,750	55,000	.009033	.000766	....	....	
14,000	56,000	.010000	.000967	....	....	
14,250	57,000	.011067	.001067	....	....	
14,500	58,000	.012100	.001033	....	....	
14,750	59,000	.013133	.001033	....	....	
15,000	60,000	.014333	.001200	....	....	
15,500	62,000	.016500	.002167	....	....	
16,000	64,000	.020000	.003500	....	....	
16,500	66,000	.022167	.002167	....	....	
17,000	68,000	.025667	.003500	....	....	
17,500	70,000	.028067	.003000	....	....	
18,000	72,000	.035667	.007600	....	....	
18,500	74,000	.037500	.001833	....	....	
19,000	76,000	.041333	.003833	....	....	
19,500	78,000	.046333	.005000	....	....	
20,000	80,000	.053733	.007400	....	....	
20,500	82,000	.064500	.010767	....	....	
21,000	84,000	.0800	.0155	....	....	
21,500	86,000	.1133	.0333	....	....	Tensile strength.
19,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.1933
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		".75 from neck
Character of broken surface		silky, interspersed with granular metal; surface irregular
Elongation of inch sections		".36*, ".12, ".10

TUBE No. 33.—8″ *Converted Rifle.*

No. 956.

Marks, $^{8\,T_{33}}_{B\,T_1\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	.000033	.000033	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	.000033	0.	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	Elastic limit.
10,750	43,000	.001600	.000267	....	....	
11,000	44,000	.002533	.000933	....	....	
11,250	45,000	.004133	.001600	.002533	.002500	
11,500	46,000	.005667	.001534	....	....	
11,750	47,000	.006433	.000766	....	....	
12,000	48,000	.007567	.001134	....	....	
12,250	49,000	.008567	.001000	....	....	
12,500	50,000	.009800	.001233	.007933	.005400	
12,750	51,000	.010500	.000700	....	....	
13,000	52,000	.011633	.001133	....	....	
13,250	53,000	.012833	.001200	....	....	
13,500	54,000	.014500	.001667	....	....	
13,750	55,000	.015833	.001333	....	....	
14,000	56,000	.017067	.001234	....	....	
14,250	57,000	.018400	.001333	....	....	
14,500	58,000	.020000	.001600	....	....	
14,750	59,000	.021333	.001333	....	....	
15,000	60,000	.023000	.001667	....	....	
15,500	62,000	.026600	.003600	....	....	
16,000	64,000	.030000	.003400	....	....	
16,500	66,000	.034333	.004333	....	....	
17,000	68,000	.040000	.005667	....	....	
17,500	70,000	.046667	.006667	....	....	
18,000	72,000	.053333	.006666	....	....	
18,500	74,000	.061667	.008334	....	....	
19,000	76,000	.073333	.011666	....	....	
19,500	78,000	.1000	.026667	....	....	
19,720	78,880	.1400	.0400	....	....	Tensile strength.

General summary.

Specific gravity		7.8604
Hardness		13.72
Tensile strength per square inch of original section	pounds..	78,880
Elastic limit per square inch of original section	do ...	42,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.75 from neck; oblique
Character of broken surface		silky
Elongation of inch sections		″.33*, ″.16, ″.11

No. 957.

Marks, $B\,\overset{8\,T_{8}}{T_{2}}\,O$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	...	
2,500	10,000	.000233	.000166	0.	...	
3,750	15,000	.000400	.000167	0.	...	
5,000	20,000	.000533	.000133	0.	...	
6,250	25,000	.000700	.000167	0.	...	
7,500	30,000	.000867	.000167	0.	...	
8,750	35,000	.001000	.000133	0.	...	
9,000	36,000	.001000	0.	...	...	
9,250	37,000	.001033	.000033	...	...	
9,500	38,000	.001100	.000067	...	...	
9,750	39,000	.001133	.000033	...	...	
10,000	40,000	.001200	.000067	.000033	.000033	
10,250	41,000	.001267	.000067	...	...	Elastic limit.
10,500	42,000	.001367	.000100	...	...	
10,750	43,000	.003267	.001900	...	...	
11,000	44,000	.004833	.001566	...	...	
11,250	45,000	.005767	.000934	.004133	.004100	
11,500	46,000	.006933	.001166	...	...	
11,750	47,000	.007633	.000700	...	...	
12,000	48,000	.008733	.001100	...	...	
12,250	49,000	.009967	.001234	...	...	
12,500	50,000	.011033	.001066	.009067	.004934	
12,750	51,000	.011667	.000634	...	...	
13,000	52,000	.013000	.001333	...	...	
13,250	53,000	.014000	.001000	...	...	
13,500	54,000	.015500	.001500	...	...	
13,750	55,000	.017067	.001567	...	...	
14,000	56,000	.018767	.001700	...	...	
14,250	57,000	.019933	.001166	...	...	
14,500	58,000	.021333	.001400	...	...	
14,750	59,000	.022667	.001334	...	...	
15,000	60,000	.024333	.001666	...	...	
15,500	62,000	.027667	.003334	...	...	
16,000	64,000	.031667	.004000	...	...	
16,500	66,000	.036500	.004833	...	...	
17,000	68,000	.041500	.005000	...	...	
17,500	70,000	.047333	.005833	...	...	
18,000	72,000	.054000	.006667	...	...	
18,500	74,000	.064000	.010000	...	...	
19,000	76,000	.0867	.0227	...	...	
19,500	78,000	.1067	.0200	...	...	
19,710	78,840	.1467	.0400	...	...	Tensile strength.
16,800	...	...	...	...	...	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	78,840
Elastic limit per square inch of original section	do	41,000
Elongation per inch after rupture	inch	0.2400
Elongation per inch under strain at elastic limit	do	.001267
Reduction in diameter at point of rupture	do	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		at middle of stem
Character of broken surface		silky
Elongation of inch sections		″.16, ″.44*, ″.12

No. 958.

Marks, $\overset{8\,T_{18}}{B\,T_3\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000033	.000033	Elastic limit.
10,250	41,000	.001400	.000167	....	....	
10,500	42,000	.001867	.000467	....	....	
10,750	43,000	.003133	.001266	....	....	
11,000	44,000	.004467	.001334	....	....	
11,250	45,000	.005600	.001133	.004033	.004000	
11,500	46,000	.006333	.000733	....	....	
11,750	47,000	.007133	.000800	....	....	
12,000	48,000	.008467	.001334	....	....	
12,250	49,000	.009467	.001000	....	....	
12,500	50,000	.010100	.000933	.008500	.004467	
12,750	51,000	.010933	.000533	....	....	
13,000	52,000	.012267	.001334	....	....	
13,250	53,000	.013500	.001233	....	....	
13,500	54,000	.014667	.001167	....	....	
13,750	55,000	.015700	.001033	....	....	
14,000	56,000	.017067	.001367	....	....	
14,250	57,000	.018500	.001433	....	....	
14,500	58,000	.020000	.001500	....	....	
14,750	59,000	.021533	.001533	....	....	
15,000	60,000	.023033	.001500	....	....	
15,500	62,000	.026300	.003267	....	....	
16,000	64,000	.029333	.003033	....	....	
16,500	66,000	.033600	.004267	....	....	
17,000	68,000	.039000	.005400	....	....	
17,500	70,000	.044167	.005167	....	....	
18,000	72,000	.050000	.005833	....	....	
18,500	74,000	.058233	.008233	....	....	
19,000	76,000	.068333	.010100	....	....	
19,500	78,000	.0900	.021667	....	....	
20,000	80,000	.1200	.0300	....	....	
20,060	80,240	.1567	.0367	....	....	Tensile strength.
16,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,240
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2567
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.62 from middle of stem
Character of broken surface		silky
Elongation of inch sections		″.34*, ″.30, ″.13

No. 959.

Marks, $\overset{8\,T_{s}}{M\,T_{1}\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000133	. 000133	0.		
2, 500	10, 000	. 000333	. 000200	0.		
3, 750	15, 000	. 000500	. 000167	0.		
5, 000	20, 000	. 000633	. 000133	0.		
6, 250	25, 000	. 000767	. 000134	0.		
7, 500	30, 000	. 000933	. 000166	0.		
8, 750	35, 000	. 001100	. 000167	0.		
9, 000	36, 000	. 001133	. 000033			
9, 250	37, 000	. 001167	. 000034			
9, 500	38, 000	. 001200	. 000033			
9, 750	39, 000	. 001233	. 000033			
10, 000	40, 000	. 001267	. 000034	. 000000		
10, 250	41, 000	. 001300	. 000033			
10, 500	42, 000	. 001333	. 000033			
10, 750	43, 000	. 001367	. 000034			
11, 000	44, 000	. 001400	. 000033			
11, 250	45, 000	. 001433	. 000033	. 000033	. 000033	
11, 500	46, 000	. 001467	. 000034			
11, 750	47, 000	. 001500	. 000033			
12, 000	48, 000	. 001533	. 000033			
12, 250	49, 000	. 001567	. 000034			
12, 500	50, 000	. 001600	. 000033	. 000033	0.	
12, 750	51, 000	. 001633	. 000033			
13, 000	52, 000	. 001667	. 000034			Elastic limit.
13, 250	53, 000	. 001867	. 000200			
13, 500	54, 000	. 006367	. 003500			
13, 750	55, 000	. 006933	. 000566			
14, 000	56, 000	. 007933	. 001000			
14, 250	57, 000	. 008733	. 000800			
14, 500	58, 000	. 010167	. 001434			
14, 750	59, 000	. 011267	. 001100			
15, 000	60, 000	. 012900	. 001633			
15, 500	62, 000	. 014267	. 001367			
16, 000	64, 000	. 016633	. 002366			
16, 500	66, 000	. 019733	. 003100			
17, 000	68, 000	. 022333	. 002600			
17, 500	70, 000	. 025067	. 002734			
18, 000	72, 000	. 028667	. 003600			
18, 500	74, 000	. 032000	. 003333			
19, 000	76, 000	. 036000	. 004000			
19, 500	78, 000	. 040400*	. 004400			
20, 000	80, 000	. 045667	. 005267			
20, 500	82, 000	. 053000	. 007333			
21, 000	84, 000	. 062000	. 009000			
21, 500	86, 000	. 0767	. 0147			
22, 000	88, 000	. 1067	. 0300			
22, 150	88, 600	. 1367	. 0300			Tensile strength.

General summary.

Specific gravity		7. 8574
Hardness		17. 17
Tensile strength per square inch of original section	pounds..	88, 600
Elastic limit per square inch of original section	do....	52, 000
Elongation per inch after rupture	inch..	0. 2067
Elongation per inch under strain at elastic limit	do....	. 001667
Reduction in diameter at point of rupture	do....	. 134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		1″ from neck
Character of broken surface		silky; with traces of granular metal
Elongation of inch sections		″.32*, ″.19, ″.11

No. 960.

Marks, $\overset{8\ \mathrm{T_8}}{\mathrm{M\ T_2O}}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000867	.000167	0	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001167	.000134	0.	....	
10,250	41,000	.001233	.000066	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001367	.000067	....	....	
11,250	45,000	.001400	.000033	0.	....	Elastic limit.
11,500	46,000	.003667	.002267	....	....	
11,750	47,000	.006667	.003000	....	....	
12,000	48,000	.007833	.001166	....	....	
12,250	49,000	.009000	.001167	....	....	
12,500	50,000	.010267	.001267	.008233	.008233	
12,750	51,000	.010600	.000333	....	....	
13,000	52,000	.011433	.000833	....	....	
13,250	53,000	.012500	.001067	....	....	
13,500	54,000	.013600	.001100	....	....	
13,750	55,000	.014667	.001067	....	....	
14,000	56,000	.016800	.002133	....	....	
14,250	57,000	.018033	.001233	....	....	
14,500	58,000	.019167	.001134	....	....	
14,750	59,000	.020400	.001233	....	....	
15,000	60,000	.022000	.001600	....	....	
15,500	62,000	.024667	.002667	....	....	
16,000	64,000	.027900	.003233	....	....	
16,500	66,000	.031367	.003467	....	....	
17,000	68,000	.035333	.003966	....	....	
17,500	70,000	.041167	.005834	....	....	
18,000	72,000	.047500	.006333	....	....	
18,500	74,000	.055000	.007500	....	....	
19,000	76,000	.065333	.010333	....	....	
19,500	78,000	.075833	.010500	....	....	
20,000	80,000	.1000	.024167	....	....	
20,390	81,560	.1583	.0533	....	....	Tensile strength.
18,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	81,560
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		''.75 from middle of stem
Character of broken surface		granular, 50 per centum; silky, 50 per centum
Elongation of inch sections		''.27*, ''.26, ''.15

No. 961.

Marks, $\overset{8\ T_8}{M\ T_3 M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	.000033	.000033	
6,250	25,000	.000800	.000167	.000033	0.	
7,500	30,000	.000967	.000167	.000067	.000034	
8,750	35,000	.001133	.000166	.000067	0.	
10,000	40,000	.001300	.000167	.000067	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	Elastic limit.
11,000	44,000	.002267	.000867	....	....	
11,250	45,000	.004000	.001733	.002467	.002400	
11,500	46,000	.005500	.001500	....	....	
11,750	47,000	.006833	.001333	....	....	
12,000	48,000	.007800	.000967	....	....	
12,250	49,000	.008833	.001033	....	....	
12,500	50,000	.009933	.001100	.008067	.005600	
12,750	51,000	.010700	.000767	....	....	
13,000	52,000	.011600	.000900	....	....	
13,250	53,000	.012667	.001067	....	....	
13,500	54,000	.014000	.001333	....	....	
13,750	55,000	.015133	.001133	....	....	
14,000	56,000	.016600	.001467	....	....	
14,250	57,000	.018000	.001400	....	....	
14,500	58,000	.019000	.001000	....	....	
14,750	59,000	.020067	.001067	....	....	
15,000	60,000	.021833	.001766	....	....	
15,500	62,000	.024600	.002767	....	....	
16,000	64,000	.028000	.003400	....	....	
16,500	66,000	.032000	.004000	....	....	
17,000	68,000	.036667	.004667	....	....	
17,500	70,000	.041167	.004500	....	....	
18,000	72,000	.047000	.005833	....	....	
18,500	74,000	.053667	.006667	....	....	
19,000	76,000	.063333	.009666	....	....	
19,500	78,000	.075000	.011667	....	....	
20,000	80,000	.1000	.0250	....	....	
20,160	80,640	.1333	.0333	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	80,640
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.45 from neck
Character of broken surface		silky, interspersed with granular metal
Elongation of inch sections		″.35*, ″.11, ″.09

TUBE No. 34—8″ *Converted Rifle.*

No. 980.

Marks, $\genfrac{}{}{0pt}{}{8\,T_{34}}{B\,T_1\,I}$
Diameter, **″.564.**
***Sectional* area, .25 square inch.**

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000267	.000200	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	.000033	.000033	
9, 000	36, 000	.001133	.000033	....	....	
9, 250	37, 000	.001133	0.	....	....	
9, 500	38, 000	.001167	.000034	....	....	
9, 750	39, 000	.001233	.000066	....	....	Elastic limit.
10, 000	40, 000	.001400	.000167	.000133	.000100	
10, 250	41, 000	.002167	.000767	....	....	
10, 500	42, 000	.003267	.001100	....	....	
10, 750	43, 000	.004600	.001333	....	....	
11, 000	44, 000	.005933	.001333	....	....	
11, 250	45, 000	.006933	.001000	.005400	.005267	
11, 500	46, 000	.008033	.001100	....	....	
11, 750	47, 000	.008933	.000900	....	....	
12, 000	48, 000	.010600	.001667	....	....	
12, 250	49, 000	.011633	.001033	....	....	
12, 500	50, 000	.013600	.001967	.011700	.006300	
12, 750	51, 000	.015333	.001733	....	....	
13, 000	52, 000	.016500	.001167	....	....	
13, 250	53, 000	.017500	.001000	....	....	
13, 500	54, 000	.019000	.001500	....	....	
13, 750	55, 000	.020333	.001333	....	....	
14, 000	56, 000	.022433	.002100	....	....	
14, 250	57, 000	.024000	.001567	....	....	
14, 500	58, 000	.026100	.002100	....	....	
14, 750	59, 000	.027667	.001567	....	....	
15, 000	60, 000	.031000	.003333	....	....	
15, 500	62, 000	.036000	.005000	....	....	
16, 000	64, 000	.041167	.005167	....	....	
16, 500	66, 000	.048167	.007000	....	....	
17, 000	68, 000	.057000	.008833	....	....	
17, 500	70, 000	.069667	.012667	....	....	
18, 000	72, 000	.0900	.020333	....	....	
18, 470	73, 880	.1567	.0667	....	....	Tensile strength.
16, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8564
Hardness		12. 66
Tensile strength per square inch of original section	pounds..	73, 880
Elastic limit per square inch of original section	do....	39, 000
Elongation per inch after rupture	inch..	0. 2267
Elongation per inch under strain at elastic limit	do....	.001233
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		″.95 from neck
Character of broken surface		silky
Elongation of inch sections		″. 39*, ″. 18, ″. 14

No. 981.

Marks, $\frac{3\ T_{31}}{B\ T_3\ O}$
Diameter, ".563.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000033	.000033	
2,500	10,000	.000233	.000166	—.000033	0.	
3,750	15,000	.000400	.000167	—.000033	0.	
5,000	20,000	.000567	.000167	—.000033	0.	
6,250	25,000	.000700	.000133	—.000033	0.	
7,500	30,000	.000867	.000167	—.000033	0.	
8,750	35,000	.001033	.000166	—.000033	0.	
9,000	36,000	.001033	.0	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001200	.000067	0.	.000033	
10,250	41,000	.001267	.000067	....	....	Elastic limit.
10,500	42,000	.001367	.000100	....	....	
10,750	43,000	.001900	.000533	....	....	
11,000	44,000	.003500	.002600	....	....	
11,250	45,000	.005400	.001900	.003767	.003767	
11,500	46,000	.006233	.000833	....	....	
11,750	47,000	.006867	.000634	....	....	
12,000	48,000	.008167	.001300	....	....	
12,250	49,000	.009467	.001300	....	....	
12,500	50,000	.010567	.001100	.008667	.004900	
12,750	51,000	.011833	.000766	....	....	
13,000	52,000	.012267	.000434	....	....	
13,250	53,000	.013267	.001000	....	....	
13,500	54,000	.014767	.001500	....	....	
13,750	55,000	.015933	.001166	....	....	
14,000	56,000	.017467	.001534	....	....	
14,250	57,000	.018567	.001100	....	....	
14,500	58,000	.020000	.001433	....	....	
14,750	59,000	.021500	.001500	....	....	
15,000	60,000	.023000	.001500	....	....	
15,500	62,000	.026333	.003333	....	....	
16,000	64,000	.029667	.003334	....	....	
16,500	66,000	.035333	.005666	....	....	
17,000	68,000	.039833	.004500	....	....	
17,500	70,000	.045667	.005834	....	....	
18,000	72,000	.053167	.007500	....	....	
18,500	74,000	.061167	.008000	....	....	
19,000	76,000	.075000	.013833	....	....	
19,500	78,000	.1000	.0250	....	....	
19,710	78,840	.1367	.0367	....	....	Tensile strength.
17,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78,840
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2100
Elongation per inch under strain at elastic limit	do....	.001267
Reduction in diameter at point of rupture	do....	.143
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		'.62 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".26, ".27*, ".10

No. 982.

Marks, $^{8\ T_M}_{B\ T_3\ M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total	Per square inch.					
Pounds.	Pounds.	Inch.	Inch.	Inch.	Inch.	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	.000033	.000033	
8,750	35,000	.001100	.000167	.000033	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001267	.000067	....	....	
10,000	40,000	.001333	.000066	.000100	.000067	Elastic limit.
10,250	41,000	.002100	.000767	....	....	
10,500	42,000	.006233	.004133	....	....	
10,750	43,000	.006867	.000634	....	....	
11,000	44,000	.008267	.001400	....	....	
11,250	45,000	.008800	.000533	.007133	.007033	
11,500	46,000	.009767	.000967	....	....	
11,750	47,000	.010567	.000800	....	....	
[illegible]	48,000	.012067	.001500	....	....	
[illegible]	49,000	.013067	.001000	....	....	
[illegible]	50,000	.014700	.001633	.012767	.005634	
[illegible]	51,000	.015333	.000633	....	....	
[illegible]	52,000	.016700	.001367	....	....	
[illegible]	53,000	.018033	.001333	....	....	
[illegible]	54,000	.019900	.001867	....	....	
[illegible]	55,000	.021167	.001267	....	....	
[illegible]	56,000	.023000	.001833	....	....	
[illegible]	57,000	.025333	.002333	....	....	
[illegible]	58,000	.027333	.002000	....	....	
[illegible]	59,000	.028933	.001600	....	....	
[illegible]	60,000	.031167	.002234	....	....	
[illegible]	62,000	.036000	.004833	....	....	
[illegible]	64,000	.041233	.005233	....	....	
[illegible]	66,000	.047267	.006034	....	....	
[illegible]	68,000	.055000	.007733	....	....	
17,500	70,000	.065000	.010000	....	....	
18,000	72,000	.0767	.0117	....	....	
18,500	74,000	.1067	.0300	....	....	
18,790	75,160	.1633	.0566	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 75,160
Elastic limit per square inch of original section .... do.... 40,000
Elongation per inch after rupture .... inch.. 0.2567
Elongation per inch under strain at elastic limit .... do.... .001333
Elongation per inch at point of rupture .... do.... .154
Reduction in diameter at point of rupture ....
Reduction in area after rupture, per centum of original section 47.2
Position of rupture .... ″.65 from middle of stem
Character of broken surface .... silky
Elongation of inch sections .... ″.36*, ″.29, ″.12

No. 983.

Marks, $\overset{8}{\text{M}}\,\overset{\text{T}_{34}}{\text{T}_1}\,\text{I}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001200	0.	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	Elastic limit.
11,000	44,000	.001500	.000200	....	....	
11,250	45,000	.002033	.000533	.000600	.000600	
11,500	46,000	.003133	.001100	....	....	
11,750	47,000	.004667	.001534	....	....	
12,000	48,000	.005667	.001000	....	....	
12,250	49,000	.007067	.001400	....	....	
12,500	50,000	.008367	.001300	.006600	.006000	
12,750	51,000	.008967	.000600	....	....	
13,000	52,000	.010100	.001133	....	....	
13,250	53,000	.011167	.001067	....	....	
13,500	54,000	.012667	.001500	....	....	
13,750	55,000	.014000	.001333	....	....	
14,000	56,000	.015667	.001667	....	....	
14,250	57,000	.016933	.001266	....	....	
14,500	58,000	.017967	.001034	....	....	
14,750	59,000	.019033	.001066	....	....	
15,000	60,000	.021300	.002267	....	....	
15,500	62,000	.024000	.002700	....	....	
16,000	64,000	.027333	.003333	....	....	
16,500	66,000	.031333	.004000	....	....	
17,000	68,000	.036333	.005000	....	....	
17,500	70,000	.042000	.005667	....	....	
18,000	72,000	.048333	.006333	....	....	
18,500	74,000	.056667	.008334	....	....	
19,000	76,000	.068667	.012000	....	....	
19,500	78,000	.0900	.021333	....	....	
19,870	79,480	.1400	.0500	....	....	Tensile strength.

General summary.

Specific gravity		7.8536
Hardness		15.20
Tensile strength per square inch of original section	pounds..	79,480
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.2267
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		".88 from neck
Character of broken surface		granular, 40 per centum; silky, 60 per centum
Elongation of inch sections		".35*, ".18, ".15

No. 984.

Marks, $^{8}_{M}{}^{T_{34}}_{T_{3}}O$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	.0	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000467	.000134	0.	....	
6,250	25,000	.000633	.000166	0.	....	
7,500	30,000	.000800	.000167	0.	....	
8,750	35,000	.000967	.000167	0.	....	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001033	0.	....	....	
9,750	39,000	.001067	.000034	....	....	
10,000	40,000	.001100	.000033	0.	....	
10,250	41,000	.001167	.000067	....	....	Elastic limit.
10,500	42,000	.002467	.001300	....	....	
10,750	43,000	.004767	.002300	....	....	
11,000	44,000	.005833	.001066	....	....	
11,250	45,000	.006767	.000934	.005233	.005233	
11,500	46,000	.008333	.001566	....	....	
11,750	47,000	.009000	.000667	....	....	
12,000	48,000	.010133	.001133	....	....	
12,250	49,000	.011300	.001167	....	....	
12,500	50,000	.012733	.001433	.010833	.005600	
12,750	51,000	.013533	.000800	....	....	
13,000	52,000	.014667	.001134	....	....	
13,250	53,000	.015633	.000966	....	....	
13,500	54,000	.017367	.001734	....	....	
13,750	55,000	.018600	.001233	....	....	
14,000	56,000	.020333	.001733	....	....	
14,250	57,000	.021833	.001500	....	....	
14,500	58,000	.023500	.001667	....	....	
14,750	59,000	.025333	.001833	....	....	
15,000	60,000	.027000	.001667	....	....	
15,500	62,000	.031433	.004433	....	....	
16,000	64,000	.035667	.004234	....	....	
16,500	66,000	.041167	.005500	....	....	
17,000	68,000	.046667	.005500	....	....	
17,500	70,000	.055000	.008333	....	....	
18,000	72,000	.066667	.011667	....	....	
18,500	74,000	.0767	.010033	....	....	
19,000	76,000	.1133	.0366	....	....	
19,150	76,600	.1633	.0500	....	....	Tensile strength.
16,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	76,600
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.2600
Elongation per inch under strain at elastic limit	do....	.001167
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		".1 from middle of stem
Character of broken surface		silky
Elongation of inch sections		".17, ".45*, ".16

No. 985.

Marks, $\overset{8\,T_M}{M\,T_3\,M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000400	.000167	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
9, 000	36, 000	.001100	.000033	....	....	
9, 250	37, 000	.001133	.000033	....	....	
9, 500	38, 000	.001200	.000067	....	....	
9, 750	39, 000	.001233	.000033	....	....	
10, 000	40, 000	.001300	.000067	.000100	.000100	Elastic limit.
10, 250	41, 000	.001400	.000100	....	....	
10, 500	42, 000	.001700	.000300	....	....	
10, 750	43, 000	.002400	.000700	....	....	
11, 000	44, 000	.003900	.001500	....	....	
11, 250	45, 000	.004767	.000867	.003233	.003133	
11, 500	46, 000	.005833	.001066	....	....	
11, 750	47, 000	.006667	.000834	....	....	
12, 000	48, 000	.007900	.001233	....	....	
12, 250	49, 000	.008767	.000867	....	....	
12, 500	50, 000	.010000	.001233	.008100	.004867	
12, 750	51. 000	.010700	.000700	....	....	
13, 000	52, 000	.011633	.000933	....	....	
13, 250	53, 000	.012767	.001134	....	....	
13, 500	54, 000	.015233	.002466	....	....	
13, 750	55, 000	.016000	.000767	....	....	
14, 000	56, 000	.017167	.001167	....	....	
14, 250	57, 000	.018500	.001333	....	....	
14, 500	58, 000	.020000	.001500	....	....	
14, 750	59, 000	.021833	.001833	....	....	
15, 000	60, 000	.023000	.001667	....	....	
15, 500	62, 000	.026500	.003500	....	....	
16, 000	64, 000	.029567	.003067	....	....	
16, 500	66, 000	.033600	.004033	....	....	
17, 000	68, 000	.038767	.005167	....	....	
17, 500	70, 000	.044500	.005733	....	....	
18, 000	72, 000	.051667	.007167	....	....	
18, 500	74, 000	.060500	.008833	....	....	
19, 000	76, 000	.073333	.012833	....	....	
19, 500	78, 000	.0967	.023367	....	....	
19, 700	78, 800	.1600	.0633	....	....	Tensile strength.
17, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	78, 800
Elastic limit per square inch of original section	do....	40, 000
Elongation per inch after rupture	inch..	0. 2567
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		1" from neck
Character of broken surface		silky, 70 per centum; granular, 30 per centum
Elongation of inch sections		".36, ".23, ".18

TABULATION OF STEEL FROM TUBES FOR 8" CONVERTED RIFLES.

No. of test.	Number of tube.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
731	1	Breech I	44,000	78,920	30.0	57.0	Silky	7.8607	11.81
732		Breech O	43,000	79,090	25.0	47.2	do		
733		Breech M	40,000	76,340	23.3	41.9	do		
734		Muzzle I	45,000	83,000	24.8	44.6	do	7.8593	13.90
725		Muzzle O	42,000	78,640	27.0	54.6	do		
736		Muzzle M	41,000	77,280	25.0	54.6	do		
646	2	Breech I	38,000	80,960	21.7	47.2	do	7.8596	13.38
647		Breech O	41,000	79,800	24.3	49.7	do		
648		Breech M	39,000	76,680	23.3	49.7	do		
649		Muzzle I	49,000	89,040	20.3	47.2	Silky, granular near circumference	7.8588	16.31
650		Muzzle O	44,000	81,680	26.3	49.7	Silky		
651		Muzzle M	47,000	90,160	20.0	39.2	Silky, granular near circumference		
802	3	Breech I	43,000	79,360	22.3	41.9	Silky	7.8625	11.81
803		Breech O	42,000	80,880	19.7	49.7	do		
804		Breech M	40,000	75,640	25.0	52.2	do		
805		Muzzle I	44,000	85,760	20.3	41.9	do	7.8551	13.46
806		Muzzle O	43,000	81,880	23.7	47.2	do		
807		Muzzle M	46,000	82,800	27.2	52.2	do		
668	4	Breech I	46,000	88,120	20.0	47.2	do	7.8563	14.38
669		Breech O	49,000	89,480	21.3	47.2	do		
670		Breech M	45,000	85,360	21.7	44.6	do		
671		Muzzle I	52,000	90,000	18.3	47.2	do	7.8546	16.23
672		Muzzle O	47,000	85,200	21.3	49.7	do		
673		Muzzle M	47,000	83,200	25.3	49.7	do		
748		Breech I	44,000	79,200	24.0	52.2	do		
749		Breech O	44,000	79,120	24.7	47.2	do		
693	5	Breech I	40,000	80,000	14.0	24.6	Granular		
694		Breech O	43,000	79,160	24.7	49.7	Silky	7.8568	12.78
695		Breech M	38,000	79,360	27.7	49.7	do		
696		Muzzle I	43,000	78,760	29.7	49.7	do		
697		Muzzle O	46,000	82,260	23.7	49.7	do	7.8551	13.85
698		Muzzle M	45,000	78,640	24.3	54.6	do		
787		Breech I	44,000	82,960	16.7	36.4	Granular		
788		Breech I	44,000	81,240	23.0	47.2	Silky		
789		Breech O	40,000	80,560	23.7	47.2	do		

TABULATION OF STEEL FROM TUBES FOR 8" CONVERTED RIFLES—Continued.

No. of test.	Number of tube.	Location of specimen.	Elastic limit. per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
652	6	Breech I	37,000	74,400	11.0	15.0	Granular; defective spot	7.8571	13.40
653		Breech O	37,000	78,240	21.0	49.7	Silky		
654		Breech M	37,000	74,080	14.3	36.4	do		
655		Muzzle I	40,000	81,600	27.3	52.2	do	7.8571	14.12
656		Muzzle O	39,000	78,800	26.7	49.7	do		
657		Muzzle M	41,000	81,240	23.3	49.7	do		
750		Breech I	35,000	74,080	27.7	52.2	do		
751		Breech O	40,000	77,920	21.0	36.4	do		
752		Breech M	36,000	77,000	24.3	52.2	do		
841	7	Breech I	44,000	83,800	13.0	18.8	Granular	7.8528	13.65
842		Breech O	41,000	82,600	11.7	15.0	do		
843		Breech M	43,000	84,820	23.8	41.9	Granular, 60 per cent.; dull silky, 40 per cent		
844		Muzzle I	45,000	88,240	23.7	44.6	Silky, interspersed with granular metal	7.8542	14.98
845		Muzzle O	45,000	88,000	24.0	49.7	Silky		
846		Muzzle M	47,000	87,200	21.7	47.2	do		
753	8	Breech I	40,000	75,600	11.3	21.4	Fine granular; hole ".04 diameter	7.8607	11.18
754		Breech O	43,000	82,080	24.0	49.7	Silky		
755		Breech M	40,000	82,000	20.7	27.6	Fine granular; dull spot		
756		Muzzle I	47,000	86,000	25.3	41.9	Silky, 70 per cent.; fine granular, 30 per cent	7.8566	14.40
757		Muzzle O	42,000	81,040	22.3	49.7	Silky, traces of granulation		
758		Muzzle M	45,000	82,120	22.3	52.2	Fine, silky		
879		Breech I	40,000	80,160	17.0	39.2	Granular, 60 per cent.; silky, 40 per cent		
880		Breech I	41,000	80,080	17.0	44.6	Silky		
881		Breech O	39,000	77,920	23.7	52.2	do		
891	9	Breech I	45,000	81,100	23.7	47.2	do	7.8528	12.60
892		Breech O	46,000	84,840	19.7	36.4	Granular, 55 per cent.; dull silky, 45 per cent		
893		Breech M	43,000	80,160	23.3	36.4	Silky		
894		Muzzle I	51,000	91,040	22.7	49.7	do	7.8522	16.23
895		Muzzle O	50,000	90,480	22.0	44.6	Silky, traces of granulation		
896		Muzzle M	45,000	87,360	22.3	44.6	Silky		
719	10	Breech I	41,000	80,120	23.7	47.2	do	7.8554	11.92
720		Breech O	43,000	80,880	23.7	52.2	do		
721		Breech M	40,000	78,320	17.3	47.2	do		
722		Muzzle I	46,000	81,300	24.0	44.6	Silky, interspersed with fine granulation	7.8536	13.53
723		Muzzle O	47,000	86,960	23.7	47.2	Silky		
724		Muzzle M	46,000	85,620	22.7	44.6	do		

912	....	Muzzle O	42,000	80,200	19.7	35.5	Granular, 60 per cent.; dull silky, 40 per cent	....	....
913	....	Muzzle M	41,000	79,400	26.3	52.2	Silky	7.8561	13.08
868	21	Breech I	44,000	81,400	22.7	57.0	do	....	....
869	....	Breech O	42,000	80,160	24.0	57.0	do	....	....
870	....	Breech M	41,000	80,000	24.7	47.2	do	7.8587	14.26
871	....	Muzzle I	46,000	86,000	20.3	47.2	do	....	....
871½	....	Muzzle O	45,000	83,760	23.0	52.2	do	....	....
872	....	Muzzle M	43,000	82,600	22.5	49.7	do	....	....
873	22	Breech I	38,000	74,640	26.3	47.2	do	7.8545	11.18
874	....	Breech O	39,000	78,000	23.3	49.7	do	....	....
875	....	Breech M	40,000	78,080	22.3	44.6	do	....	....
876	....	Muzzle I	39,000	75,240	22.3	57.0	Fine silky	7.8562	11.75
877	....	Muzzle O	39,000	75,360	24.7	54.6	Silky	....	....
878	....	Muzzle M	37,000	78,120	24.0	61.5	Fine silky	....	....
920	23	Breech I	44,000	78,160	23.0	49.7	Silky	7.8541	9.20
921	....	Breech O	41,000	77,440	20.8	27.6	Granular, radiating from hole at the circumference	....	....
922	....	Breech M	40,000	74,000	28.7	54.6	Silky	....	....
923	....	Muzzle I	45,000	82,000	19.7	39.2	Granular with dull silky spot	7.8511	11.70
924	....	Muzzle O	43,000	80,440	25.0	47.2	Silky, interspersed with granular metal	....	....
925	....	Muzzle M	43,000	82,880	24.7	47.2	Silky, 30 per cent., interspersed with granular metal	....	....
885½	24	Breech I	44,000	76,800	26.0	59.3	Silky	7.8632	11.81
886	....	Breech O	41,000	80,480	26.7	52.2	do	....	....
887	....	Breech M	41,000	79,160	24.7	54.6	do	....	....
888	....	Muzzle I	45,000	86,360	23.3	47.2	Silky, traces of granulation	7.8593	14.54
889	....	Muzzle O	43,000	83,280	25.0	47.2	Silky	....	....
890	....	Muzzle M	41,000	82,440	23.7	49.7	Silky, traces of granulation	....	....
914	25	Breech I	43,000	78,800	24.3	49.7	Silky	7.8594	12.60
915	....	Breech O	44,000	81,820	23.7	47.2	do	....	....
916	....	Breech M	45,000	81,760	26.7	49.7	do	....	....
917	....	Muzzle I	45,000	84,080	20.3	47.2	Silky, interspersed with granular metal	7.8551	13.59
918	....	Muzzle O	43,000	77,280	22.0	52.2	Silky	....	....
919	....	Muzzle M	44,000	86,080	23.0	44.6	Silky, interspersed with granular metal	....	....
968	26	Breech I	40,000	75,200	20.3	27.6	Granular, dull silky spot	7.8571	12.96
969	....	Breech O	41,000	77,920	23.0	36.4	do	....	....
970	....	Breech M	40,000	78,200	27.0	52.2	Silky	....	....
971	....	Muzzle I	44,000	81,880	18.0	21.4	Granular; small dull spot	7.8561	16.15
972	....	Muzzle O	40,000	83,760	24.3	49.7	Silky, traces of granulation	....	....
973	....	Muzzle M	41,000	83,000	25.7	49.7	Silky	....	....
936	28	Breech I	45,000	80,240	24.0	52.2	do	7.8667	14.54
937	....	Breech O	40,000	82,000	22.7	49.7	do	....	....
938	....	Breech M	43,000	82,000	22.8	49.7	do	....	....
939	....	Muzzle I	46,000	83,960	20.7	52.2	do	7.8606	15.20
940	....	Muzzle O	44,000	84,560	25.3	52.2	do	....	....
941	....	Muzzle M	43,000	84,200	24.7	49.7	do	....	....
929	29	Breech I	40,000	78,160	25.7	52.2	do	7.8585	10.24

TABULATION OF STEEL FROM TUBES FOR 8″ CONVERTED RIFLES—Continued.

No. of test.	Number of tube.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
884	....	Breech M	37,000	68,800	6.3	11.8	Fine, granular; blow-hole	....	....
885	....	Breech M	39,000	76,720	18.0	44.6	Silky	....	....
852	16	Breech I	41,000	78,400	20.3	52.2	Silky	7.8586	11.59
853	....	Breech O	44,000	83,800	21.3	36.4	Silky, 70 per cent.; granular, 30 per cent.	....	....
854	....	Breech M	42,000	82,920	13.7	21.4	Fine granular, radiating from dull spot	....	....
855	....	Muzzle I	48,000	87,880	18.0	33.5	Granular, radiating from dull spot	7.8390	12.80
856	....	Muzzle O	43,000	81,900	24.0	24.6	Granular, 60 per cent.; dull flaky, 40 per cent	....	....
857	....	Muzzle M	39,000	76,560	15.7	52.2	Silky	....	....
792	17	Breech I	43,000	81,440	13.7	21.4	Granular, radiating from a dull spot	7.8609	12.84
793	....	Breech O	43,000	86,400	23.3	47.2	Silky	....	....
794	....	Breech M	42,000	83,280	22.3	36.4	Granular, 60 per cent.; in silky, 40 per cent	....	....
795	....	Muzzle I	44,000	83,400	20.0	49.7	Silky	7.8607	13.85
796	....	Muzzle O	45,000	89,520	18.3	36.4	Granular	....	....
797	....	Muzzle M	45,000	90,600	16.3	33.5	Granular, radiating from center	....	....
900	....	Breech I	41,000	76,280	24.3	57.0	Silky	....	....
901	....	Breech I	43,000	77,680	26.7	54.6	Fine silky	....	....
902	....	Breech M	36,000	74,600	26.0	54.6	......do	....	....
903	....	Breech M	39,000	75,680	23.3	54.6	......do	....	....
904	....	Muzzle I	37,000	76,000	12.0	18.3	Fine granular, radiating from a blow-hole	....	....
905	....	Muzzle O	36,000	76,680	21.3	39.2	Granular, 70 per cent.; dull silky, 30 per cent	....	....
906	....	Muzzle M	35,000	75,920	26.3	49.7	Silky	....	....
907	....	Muzzle M	40,000	80,280	20.7	39.2	Granular, dull silky center	....	....
858	18	Breech I	41,000	82,800	19.0	33.5	Granular, 70 per cent.; silky, 30 per cent	7.8569	12.42
859	....	Breech O	44,000	85,120	20.3	41.9	Silky, 70 per cent.; granular, 30 per cent	....	....
860	....	Breech M	41,000	81,640	25.3	44.6	Silky, 60 per cent.; granular, 40 per cent	....	....
861	....	Muzzle I	51,000	89,280	22.3	41.9	......do......do	7.8548	14.98
862	....	Muzzle O	51,000	92,200	21.3	47.2	Silky, interpersed with granular metal	....	....
863	....	Muzzle M	48,000	89,520	22.7	47.2	Silky, traces of granular metal	....	....
815	19	Breech I	36,000	74,480	15.3	30.6	Dull silky	7.8622	11.39
816	....	Breech O	39,000	78,280	23.0	47.2	Silky	....	....
817	....	Breech M	35,000	70,400	9.3	21.4	Dull silky, lines of light colored metal	....	....
818	....	Muzzle I	41,000	84,880	20.7	33.5	Dull silky, resembles the surface of a weld	7.8610	14.06
819	....	Muzzle O	45,000	86,760	18.0	30.6	Granular, dull silky spot	....	....
820	....	Muzzle M	43,000	83,160	21.3	41.9	Dull silky, irregular surface, small granular spot	....	....
908	20	Breech I	35,000	72,520	23.0	52.2	Silky	7.8576	11.44
909	....	Breech O	38,000	77,280	23.0	49.7	......do	....	....
910	....	Breech M	37,000	75,000	26.7	47.2	......do	....	....
911	....	Muzzle I	44,000	81,360	24.0	41.9	......do	7.8559	12.84

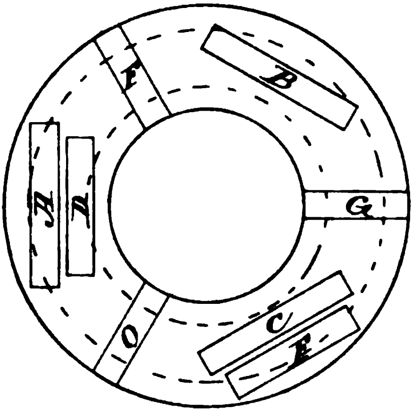
912		Muzzle O	42,000	80,200	19.7	53.5	Granular, 60 per cent.; dull silky, 40 per cent		
913		Muzzle M	41,000	79,400	25.3	52.2	Silky		
868	21	Breech I	44,000	81,400	22.7	57.0	do	7.8561	13.08
869		Breech O	42,000	80,160	24.0	57.0	do		
870		Breech M	41,000	80,000	24.7	47.2	do		
871		Muzzle I	46,000	86,000	20.3	47.2	do	7.8537	14.26
871½		Muzzle O	45,000	82,760	23.0	52.2	do		
872		Muzzle M	43,000	82,600	22.3	49.7	do		
873	22	Breech I	38,000	74,640	26.3	47.2	do	7.8545	11.18
874		Breech O	39,000	78,000	23.3	49.7	do		
875		Breech M	40,000	78,080	22.3	44.6	do		
876		Muzzle I	39,000	75,240	22.8	57.0	Fine silky	7.8562	11.75
877		Muzzle O	39,000	75,360	24.7	54.6	Silky		
878		Muzzle M	37,000	78,120	24.0	61.5	Fine silky		
920	23	Breech I	44,000	78,160	23.0	49.7	Silky	7.8541	9.20
921		Breech O	41,000	77,440	20.3	27.6	Granular, radiating from hole at the circumference		
922		Breech M	40,000	74,000	28.7	54.6	Silky		
923		Muzzle I	45,000	82,000	19.7	39.2	Granular with dull silky spot	7.8511	11.70
924		Muzzle O	43,000	80,440	25.0	47.2	Silky, interspersed with granular metal		
925		Muzzle M	43,000	82,880	24.7	47.2	Silky, 30 per cent., interspersed with granular metal		
885½	24	Breech I	44,000	76,800	26.0	59.3	Silky	7.8632	11.81
886		Breech O	41,000	80,480	26.7	52.2	do		
887		Breech M	41,000	79,160	24.7	54.6	do		
888		Muzzle I	45,000	86,860	23.3	47.2	Silky, traces of granulation	7.8593	14.54
889		Muzzle O	43,000	83,280	25.0	47.2	Silky		
890		Muzzle M	41,000	82,440	23.7	49.7	Silky, traces of granulation		
914	25	Breech I	43,000	78,800	24.3	49.7	Silky	7.8594	12.60
915		Breech O	44,000	81,820	23.7	47.2	do		
916		Breech M	45,000	81,760	26.7	49.7	do		
917		Muzzle I	45,000	84,080	20.3	47.2	Silky, interspersed with granular metal	7.8551	13.59
918		Muzzle O	43,000	77,280	22.0	52.2	Silky		
919		Muzzle M	44,000	86,080	23.0	44.6	Silky, interspersed with granular metal		
968	26	Breech I	40,000	75,200	20.3	27.6	Granular, dull silky spot	7.8571	12.96
969		Breech O	41,000	77,920	23.0	36.4	do		
970		Breech M	40,000	78,200	27.0	52.2	Silky		
971		Muzzle I	44,000	81,880	18.0	21.4	Granular; small dull spot	7.8561	16.15
972		Muzzle O	40,000	83,760	24.3	49.7	Silky, traces of granulation		
973		Muzzle M	41,000	83,000	25.7	49.7	Silky		
936	28	Breech I	45,000	80,240	24.0	52.2	do	7.8667	14.54
937		Breech O	40,000	82,000	22.7	49.7	do		
938		Breech M	43,000	82,000	22.3	49.7	do		
939		Muzzle I	46,000	83,960	20.7	52.2	do	7.8606	15.20
940		Muzzle O	44,000	84,560	25.3	52.2	do		
941		Muzzle M	43,000	84,200	24.7	49.7	do		
929	29	Breech I	40,000	78,160	25.7	52.3	do	7.8585	10.24

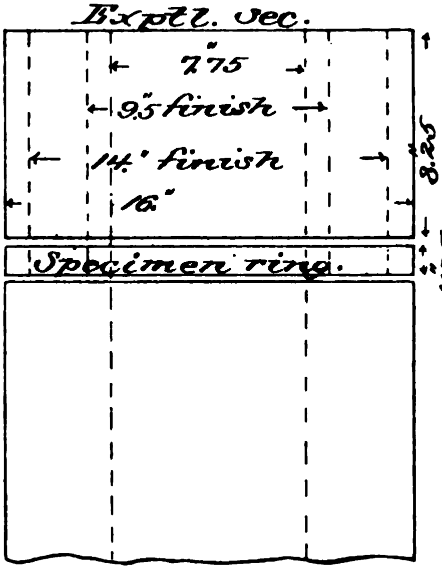
TABULATION OF STEEL FROM TUBES FOR 8-INCH CONVERTED RIFLES—Continued.

No. of test.	Number of tube.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
930	29	Breech O	40,000	77,840	26.0	52.2	Silky		
931		Breech M	41,000	77,200	23.3	52.2	do		
932		Muzzle I	47,000	85,280	18.3	49.7	Silky, interspersed with fine granulation	7.8553	12.08
933		Muzzle O	44,000	83,080	23.3	49.7	Fine, silky		
934		Muzzle M	43,000	81,440	22.3	47.2	Silky		
942	30	Breech I	39,000	74,400	23.3	54.6	do	7.8601	12.78
943		Breech O	38,000	75,240	22.7	49.7	do		
944		Breech M	37,000	74,560	27.0	57.0	do		
945		Muzzle I	46,000	79,280	22.7	41.9	Granular, 50 per cent.; silky, 50 per cent	7.8564	14.06
946		Muzzle O	42,000	79,640	24.0	49.7	Silky		
947		Muzzle M	42,000	79,240	19.0	41.9	Silky, 50 per cent.; granular, 50 per cent		
824	31	Breech I	35,000	72,240	26.0	41.9	Dull, silky	7.8618	11.33
825		Breech O	35,000	74,080	26.7	44.6	do		
826		Breech M	34,000	71,840	24.7	41.9	Silky		
827		Muzzle I	42,000	81,480	14.0	24.6	Granular, 60 per cent.; dull silky, 40 per cent	7.8555	14.40
828		Muzzle O	43,000	83,560	16.0	33.5	Dull silky, slight granulation		
829		Muzzle M	40,000	76,720	22.7	41.9	Silky		
952		Muzzle I	41,000	76,720	24.0	47.2	do		
953		Muzzle O	41,000	77,400	23.0	47.2	do		
954		Muzzle M	39,000	76,000	22.0	33.5	Granular, 80 per cent.; dull silky spot, 20 per cent		
955		Muzzle M	39,000	75,680	21.3	47.2	Silky		
974	32	Breech I	41,000	78,000	27.0	53.2	do	7.8540	14.47
975		Breech O	41,000	80,800	23.7	44.6	Silky trace of granular metal		
976		Breech M	42,000	81,040	21.3	36.4	Granular, 60 per cent.; silky, 40 per cent		
977		Muzzle I	42,000	80,840	17.3	24.6	Granular	7.8502	15.18
978		Muzzle O	43,000	80,720	21.0	44.6	Silky		
979		Muzzle M	47,000	86,000	19.3	41.9	Silky, interspersed with granular metal		
956	33	Breech I	42,000	78,880	21.7	44.6	Silky	7.8604	13.72
957		Breech O	41,000	78,840	24.0	54.6	do		
958		Breech M	40,000	80,240	25.7	49.7	do		
959		Muzzle I	52,000	88,600	20.7	41.9	Silky, with traces of granular metal	7.8574	17.17
960		Muzzle O	45,000	81,560	22.7	36.4	Silky, 50 per cent.; granular, 50 per cent		
961		Muzzle M	48,000	89,640	18.3	39.2	Silky, interspersed with granular		
980	34	Breech I	39,000	78,880	23.7	44.6	Silky	7.8564	12.66
981		Breech O	41,000	78,840	21.0	44.6	do		
982		Breech M	40,000	75,100	26.6	47.2	do		
983		Muzzle I	43,000	79,480	22.7	41.9	Silky, 60 per cent.; granular, 40 per cent	7.8536	15.20
984		Muzzle O	41,000	76,600	26.0	49.7	Silky		
985		Muzzle M	40,000	78,800	25.7	44.6	Silky, 70 per cent.; granular, 30 per cent		

8" Steel B. L. Rifle

Tube cylinder
Experimental section.





2.—8″ STEEL B. L. RIFLE.

EXPERIMENTAL SECTION.

[Steel specimens from tube, jacket, and hoops, taken before and after hooping experiment.]

No. 351.

Tension Test.

Mark on bar, A.
Diameter, ″.564.
Sectional area, .25 square inch.
Length 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000500	.000133	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000833	.000166	0.	....	
7,750	31,000	.000867	.000034	....	....	
8,000	32,000	.000900	.000033	....	....	
8,250	33,000	.000933	.000033	....	....	
8,500	34,000	.000967	.000034	....	....	
8,750	35,000	.000967	0.	0.	....	
9,000	36,000	.001000	.000033	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001133	.000033	.000067	.000067	
10,250	41,000	.001200	.000067	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001267	0.	....	....	
11,250	45,000	.001300	.000033	.000067	0.	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001367	.000034	....	....	
12,000	48,000	.001400	.000033	....	....	
12,250	49,000	.001400	0.	....	....	
12,500	50,000	.001433	.000033	.000067	0.	
12,750	51,000	.001467	.000034	....	....	
13,000	52,000	.001533	.000066	....	....	
13,250	53,000	.001600	.000067	....	....	Elastic limit.
Rapid stretching; load fell to 48,000 pounds per square inch.						
12,000	48,000	.009267	.007667	....	....	
12,250	49,000	.009833	.000566	....	....	
12,500	50,000	.011433	.001600	.009700	.009633	
12,750	51,000	.011833	.000400	....	....	
13,000	52,000	.012233	.000400	....	....	
13,250	53,000	.012800	.000567	....	....	
13,500	54,000	.014100	.001300	....	....	
13,750	55,000	.015333	.001233	.013300	.003600	
14,000	56,000	.016300	.000967	....	....	
14,250	57,000	.016933	.000633	....	....	
14,500	58,000	.018433	.001500	....	....	
14,750	59,000	.019333	.000900	....	....	
15,000	60,000	.020467	.001134	.018367	.005067	
15,500	62,000	.022800	.002333	....	....	
16,000	64,000	.025333	.002533	....	....	
16,500	66,000	.028033	.002700	....	....	
17,000	68,000	.031367	.003334	....	....	
17,500	70,000	.034933	.003566	....	....	
18,000	72,000	.039000	.004067	....	....	
18,500	74,000	.043600	.004600	....	....	
19,000	76,000	.049700	.006100	....	....	
19,500	78,000	.056767	.007067	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
20,000	80,000	0.065000	0.008233	....	....	Micrometer removed.
20,500	82,000	.0833	.0183	....	....	
21,000	84,000	.1067	.0234	....	....	
21,500	86,000	.1567	.0500	....	....	
21,510	86,040	.1700	.0133	....	....	Ultimate strength.
18,700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	86,040
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.2467
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.25 from middle of stem
Character of broken surface		silky, interspersed with slight granulation, irregular surface
Elongation of inch sections		″.18, ″.42*, ″.14

No. 352.

Tension Test.

Mark on bar, B.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000500	.000133	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.000967	.000134	0.	....	
10,000	40,000	.001133	.000166	0.	....	
10,250	41,000	.001133	0.	....	....	
10,500	42,000	.001167	.000034	....	....	
10,750	43,000	.001200	.000033	....	....	
11,000	44,000	.001233	.000033	....	....	
11,250	45,000	.001267	.000034	0.	....	
11,500	46,000	.001300	.000033	....	....	
11,750	47,000	.001333	.000033	....	....	
12,000	48,000	.001367	.000034	....	....	
12,250	40,000	.001367	0.	....	....	
12,500	50,000	.001433	.000066	0.	....	
12,750	51,000	.001467	.000034	....	....	
13,000	52,000	.001533	.000066	....	....	
13,250	53,000	.001567	.000034	....	....	
13,500	54,000	.001600	.000033	....	....	Elastic limit.
Rapid stretching; load fell to 49,000 pounds per square inch.						
12,250	49,000	.002767	.001167	....	....	
		.002933	.000166	....	....	
12,500	50,000	.005367	.002434	....	....	
12,750	51,000	.010333	.004966	....	....	
13,000	52,000	.010767	.000434	....	....	
13,250	53,000	.011433	.000666	....	....	
13,500	54,000	.012167	.000734	....	....	
13,750	55,000	.013100	.000933	.011100	.011100	
14,000	56,000	.014300	.001200	....	....	
14,250	57,000	.014833	.000533	....	....	
14,500	58,000	.015600	.000767	....	....	
14,750	59,000	.016667	001067	....	....	
15,000	60,000	.018000	.001333	.015667	.004567	
15,500	62,000	.019700	.001700	....	....	
16,000	64,000	.022267	.002567	....	....	
16,500	66,000	.024900	.002633	....	....	
17,000	68,000	.027667	.002767	....	....	
17,500	70,000	.030700	.003033	....	....	
18,000	72,000	.034033	.003333	....	....	
18,500	74,000	.037700	.003667	....	....	
19,000	76,000	.041333	.003633	....	....	
19,500	78,000	.046600	.005267	....	....	
20,000	80,000	.052700	.006100	....	....	Micrometer removed.
20,500	82,000	.0633	.0106	....	....	
21,000	84,000	.0733	.0100	....	....	
21,500	86,000	.0833	.0100	....	....	
22,000	88,000	.1100	.0267	....	....	
22.330	89,320	.1900	.0800	....	....	Ultimate strength.
19,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8613
Hardness		17.44
Tensile strength per square inch of original section	pounds..	89,320
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.24
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.2 from neck
Character of broken surface		silky, irregular surface
Elongation of inch sections		″.16, ″.24 (″.32 fractured section)

No. 353.

Tension Test.

Mark on bar, C.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000367	.000134	0.		
5,000	20,000	.000533	.000166	0.		
6,250	25,000	.000700	.000167	0.		
7,500	30,000	.000833	.000133	0.		
8,750	35,000	.001000	.000167	0.		
10,000	40,000	.001167	.000167	.000033	.000033	
10,250	41,000	.001200	.000033			
10,500	42,000	.001233	.000033			
10,750	43,000	.001267	.000034			
11,000	44,000	.001367	.000100			Elastic limit.
Rapid yielding; the load falling suddenly to 40,000 pounds per square inch.						
10,250	41,000	.002333 .002467	.000966 .000134			
10,500	42,000	.003433	.000966			
10,750	43,000	.004233	.000800			
11,000	44,000	.005133	.000900			
11,250	45,000	.005967	.000834	.004567	.004534	
11,500	46,000	.007267	.001300			
11,750	47,000	.009400	.002133			
12,000	48,000	.011000	.001600			
12,250	49,000	.011700	.000700			
12,500	50,000	.012400	.000700	.010533	.005966	
12,750	51,000	.012933	.000533			
13,000	52,000	.014133	.001200			
13,250	53,000	.014933	.000800			
13,500	54,000	.016100	.001167			
13,750	55,000	.017000	.000900	.014967	.004434	
14,000	56,000	.018333	.001333			
14,250	57,000	.018933	.000600			
14,500	58,000	.020600	.001667			
14,750	59,000	.021567	.000967			
15,000	60,000	.023267	.001700	.20867	.005900	
15,500	62,000	.025767	.002500			
16,000	64,000	.028633	.002866			
16,500	66,000	.032167	.003534			
17,000	68,000	.035467	.003300			
17,500	70,000	.040067	.004600			
18,000	72,000	.044167	.004100			
18,500	74,000	.050000	.005833			
19,000	76,000	.054500	.004500			
19,500	78,000	.065133	.010633			
20,000	80,000	.080433	.015300			Micrometer removed.
20,500	82,000	.0967	.016267			
21,000	84,000	.1367	.0400			Ultimate strength.
18,800						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	84,000
Elastic limit per square inch of original section	do	44,000
Elongation per inch after rupture	inch	0.20
Elongation per inch under strain at elastic limit	do	.001367
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		41.6
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.09, ″.16 (″.35 fractured section).

No. 385.

Compression Test.

Mark on bar, D
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000125	.000125	0.	....	
5,000	10,000	.000300	.000175	0.	....	
7,500	15,000	.000450	.000150	0.	....	
10,000	20,000	.000600	.000150	0.	....	
12,500	25,000	.000775	.000175	0.	....	
15,000	30,000	.000900	.000125	0.	....	
17,500	35,000	.001075	.000175	0.	....	
20,000	40,000	.001250	.000175	.000025	.000025	
20,500	41,000	.001300	.000050	....	....	
21,000	42,000	.001350	.000050	....	....	
21,500	43,000	.001375	.000025	....	....	
22,000	44,000	.001425	.000050	....	....	Elastic limit.
22,500	45,000	.001525	.000100	.000150	.000125	
22,750	45,500	.004125	.002600	....	....	Rapid deflection.
23,000	46,000	.004600	.000475	....	....	
23,500	47,000	.006375	.001775	....	....	
24,000	48,000	.007925	.001550	....	....	
24,500	49,000	.008850	.000925	....	....	
25,000	50,000	.009600	.000750	.007725	.007575	Test discontinued.

General summary.

Elastic limit per square inch of original section .... pounds.. 44,000
Compression per inch under stress at elastic limit..................................inch.. 0.001425

No. 384.

Compression Test.

Mark on bar, E
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000325	.000325	0.	....	
5,000	10,000	.000475	.000150	0.	....	
7,500	15,000	.000650	.000175	0.	....	
10,000	20,000	.000750	.000100	0.	....	
12,500	25,000	.001000	.000250	0.	....	
15,000	30,000	.001175	.000175	0.	....	
17,500	35,000	.001350	.000175	0.	....	
20,000	40,000	.001525	.000175	.000050	.000050	
20,500	41,000	.001600	.000075	....	....	
21,000	42,000	.001625	.000025	....	....	
21,500	43,000	.001650	.000025	....	....	
22,000	44,000	.001675	.000025	....	....	
22,500	45,000	.001700	.000025	.000075	.000025	
23,000	46,000	.001725	.000025	....	....	
23,500	47,000	.001750	.000025	....	....	
24,000	48,000	.001775	.000025	....	....	
24,500	49,000	.001800	.000025	....	....	Elastic limit.
25,000	50,000	.007400	.005600	....	....	Rapid deflection.
25,500	51,000	.009200	.001800	....	....	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	49,000
Compression per inch under stress at elastic limit	inch..	0.001800

No. 388.

Compression Test.

Mark on bar, F
Length, 3″.96.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000033	.000033	0.	....	
5,000	10,000	.000200	.000167	0.	....	
7,500	15,000	.000333	.000133	0.	....	
10,000	20,000	.000467	.000134	0.	....	
12,500	25,000	.000600	.000133	0.	....	
15,000	30,000	.000733	.000133	0.	....	
17,500	35,000	.000933	.000200	0.	....	
20,000	40,000	.001300	.000367	.000033	.000033	
20,500	41,000	.001367	.000067	....	....	
21,000	42,000	.001400	.000033	....	....	
21,500	43,000	.001433	.000033	....	....	
22,000	44,000	.001467	.000034	....	....	
22,500	45,000	.001567	.000100	.000167	.000167	
23,000	46,000	.001700	.000133	....	....	
23,500	47,000	.001767	.000067	....	....	
24,000	48,000	.001800	.000033	....	....	Elastic limit.
24,500	49,000	.002000	.000200	....	....	
25,000	50,000	.004567	.002567	.003000	.002833	Decided deflection.
25,500	51,000	.009600	.005033	....	....	
26,000	52,000	.010133	.000533	.008300	.005300	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	48,000
Compression per inch under stress at elastic limit	inch..	0.001800

No. 389.

Compression Test.

Mark on bar, G
Length, 3″.98.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000267	.000200	0.	....	
7,500	15,000	.000400	.000133	.000033	.000033	
10,000	20,000	.000600	.000200	.000033	0.	
12,500	25,000	.000733	.000133	.000067	.000034	
15,000	30,000	.001000	.000267	.000133	.000066	
15,500	31,000	.001033	.000033	....	....	
16,000	32,000	.001067	.000034	....	....	
16,500	33,000	.001200	.000133	....	....	
17,000	34,000	.001233	.000033	....	....	
17,500	35,000	.001300	.000067	.000333	.000300	
18,000	36,000	.001333	.000033	....	....	
18,500	37,000	.001367	.000034	....	....	
19,000	38,000	.001433	.000066	....	....	Elastic limit.
19,500	39,000	.001567	.000134	....	....	
20,000	40,000	.001700	.000133	.000533	.000200	
20,500	41,000	.001800	.000100	....	....	
21,000	42,000	.001967	.000167	....	....	
21,500	43,000	.002100	.000133	....	....	
22,000	44,000	.002300	.000200	....	....	
22,500	45,000	.002467	.000167	.001067	.000534	
23,000	46,000	.002700	.000233	....	....	
23,500	47,000	.002933	.000233	....	....	
24,000	48,000	.003367	.000434	....	....	
24,500	49,000	.005267	.001900	....	....	
25,000	50,000	.006933	.001666	.005133	.004066	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	38,000
Compression per inch under stress at elastic limit	inch..	0.001433

No. 407.

Compression Test.

Mark on bar, O
Length, 3″.992.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000133	.000133	0.	....	
5,000	10,000	.000333	.000200	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	0.	....	
12,500	25,000	.000833	.000166	0.	....	
15,000	30,000	.001000	.000167	0.	....	
15,500	31,000	.001000	0.	....	....	
16,000	32,000	.001033	.000033	....	....	
16,500	33,000	.001067	.000034	....	....	
17,000	34,000	.001200	.000133	....	....	
17,500	35,000	.001233	.000033	.000033	.000033	
18,000	36,000	.001300	.000067	....	....	
18,500	37,000	.001367	.000067	....	....	Elastic limit.
19,000	38,000	.001500	.000133	....	....	
19,500	39,000	.001633	.000133	....	....	
20,000	40,000	.001833	.000200	.000533	.000500	
20,500	41,000	.001967	.000134	....	....	
21,000	42,000	.002233	.000266	....	....	
21,500	43,000	.002600	.000367	....	....	
22,000	44,000	.002933	.000333	....	....	
22,500	45,000	.003667	.000734	.002200	.001667	
23,000	46,000	.004967	.001300	....	....	
23,500	47,000	.009267	.004300	....	....	
24,000	48,000	.010467	.001200	....	....	
24,500	49,000	.011200	.000733	....	....	
25,000	50,000	.012267	.001067	.010333	.008133	Test discontinued.

General summary.

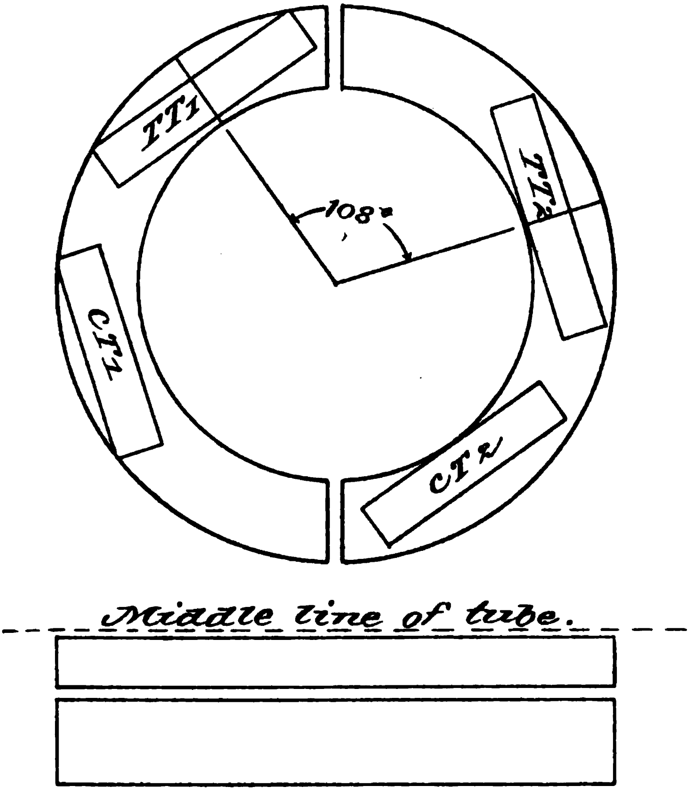
Elastic limit per square inch of original section	pounds..	37,000
Compression per inch under stress at elastic limit	inch..	0.001367

8" Steel B.L. Rifle.

Tube cylinder.

Experimental Section.

Location of specimens taken
out after unhooping.



No. 595.

Marks, T T_1
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000267	.000100	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000600	.000167	0.		
6,250	25,000	.000733	.000133	0.		
7,500	30,000	.000900	.000167	0.		
8,750	35,000	.001067	.000167	0.		
10,000	40,000	.001232	.000166	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001367	.000034			
11,250	45,000	.001400	.000033	0.		
11,500	46,000	.001433	.000033			
11,750	47,000	.001467	.000034			
12,000	48,000	.001500	.000033			
12,250	49,000	.001533	.000033			
12,500	50,000	.001567	.000034	0.		
12,750	51,000	.001633	.000066			
13,000	52,000	.001667	.000034			
13,250	53,000	.001700	.000033		a	Elastic limit.
13,500	54,000	.012333	.010633			
13,750	55,000	.012867	.000534	.010667	.010667	
14,000	56,000	.013600	.000733			
14,250	57,000	.014200	.000600			
14,500	58,000	.015267	.001067			
14,750	59,000	.016400	.001133			
15,000	60,000	.017500	.001100	.015067	.004400	
15,500	62,000	.019500	.002000			
16,000	64,000	.021333	.001833			
16,500	66,000	.023933	.002600			
17,000	68,000	.026567	.002634			
17,500	70,000	.029667	.003100			
18,000	72,000	.032833	.003166			
18,500	74,000	.036533	.003700			
19,000	76,000	.040167	.003634			
19,500	78,000	.044400	.004233			
20,000	80,000	.050000	.005600			
20,500	82,000	.056667	.006667			
21,000	84,000	.064167	.007500			
21,500	86,000	.075667	.011500			
22,000	88,000	.090733	.015066			
22,500	90,000	.1133	.022567			
22,760	91,040	.1667	.0534			Tensile strength.
22,000						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	91,040
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.2133
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.8 from neck
Character of broken surface		fine granular, radiating from a dull spot at circumference
Elongation of inch sections		″.29*, ″.18, ″.17

No. 596.

Marks, T T_2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001300	0.	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001367	.000034	0.	....	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	Elastic limit.
12,000	48,000	.006000	.004567	....	....	
12,250	49,000	.007000	.001000	....	....	
12,500	50,000	.015700	.015000	.013667	.013667	
12,750	51,000	.016067	.000367	....	....	
13,000	52,000	.016533	.000466	....	....	
13,250	53,000	.016867	.000334	....	....	
13,500	54,000	.018000	.001133	....	....	
13,750	55,000	.019433	.001433	.17167	.003500	
14,000	56,000	.020167	.000734	....	....	
14,250	57,000	.020933	.000766	....	....	
14,500	58,000	.022233	.001300	....	....	
14,750	59,000	.023267	.001034	....	....	
15,000	60,000	.025033	.001766	.022500	.005333	
15,500	62,000	.027233	.002200	....	....	
16,000	64,000	.030067	.002834	....	....	
16,500	66,000	.033333	.003266	....	....	
17,000	68,000	.036667	.003334	....	....	
17,500	70,000	.040333	.003666	....	....	
18,000	72,000	.045000	.004667	....	....	
18,500	74,000	.050000	.005000	....	....	
19,000	76,000	.054933	.004933	....	....	
19,500	78,000	.062167	.007234	....	....	
20,000	80,000	.070000	.007833	....	....	
20,500	82,000	.082000	.012000	....	....	
21,000	84,000	.098167	.016167	....	....	
21,500	86,000	.124000	.025833	....	....	
21,890	87,560	.1800	.0560	....	....	Tensile strength.
19,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section........pounds.. 87,560
Elastic limit per square inch of original section........do.... 47,000
Elongation per inch after rupture........inch.. 0.2433
Elongation per inch under strain at elastic limit........do.... .001433
Reduction in diameter at point of rupture........do.... .144
Reduction in area after rupture, per centum of original section........ 44.6
Position of rupture........″.9 from neck
Character of broken surface........silky, interspersed with fine granulation
Elongation of inch sections........″.34, ″.20, ″.19

No. 489.

Compression Test.

Marks on bar, T 1 Middle
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000150	.000150	0.	....	
5, 000	10, 000	.000400	.000250	0.	....	
7, 500	15, 000	.000525	.000125	0.	....	
10, 000	20, 000	.000575	.000200	0.	....	
12, 500	25, 000	.000850	.000125	0.	....	
15, 000	30, 000	.001075	.000225	.000025	.000025	
17, 500	35, 000	.001225	.000150	.000025	0.	
20, 000	40, 000	.001375	.000150	.000050	.000025	
20, 500	41, 000	.001400	.000025	....	....	
21, 000	42, 000	.001450	.000050	....	....	
21, 500	43, 000	.001475	.000025	....	....	
22, 000	44, 000	.001500	.000025	....	....	
22, 500	45, 000	.001525	.000025	.000075	.000025	
23, 000	46, 000	.001550	.000025	....	....	
23, 500	47, 000	.001575	.000025	....	....	
24, 000	48, 000	.001625	.000050	....	....	
24, 500	49, 000	.001675	.000050	....	....	
25, 000	50, 000	.001725	.000050	.000075	0.	
25, 500	51, 000	.001750	.000025	....	....	
26, 000	52, 000	.001775	.000025	....	....	
26, 500	53, 000	.001775	0.	....	....	Elastic limit.
27, 000	54, 000	.009300	.007525	....	....	
27, 500	55, 000	.009700	.000400	.007625	.007550	
28, 000	56. 000	.009950	.000250	....	....	
28, 500	57, 000	.010375	.000425	....	....	
29, 000	58, 000	.010975	.000600	....	....	
29, 500	59, 000	.011625	.000650	....	....	
30, 000	60, 000	.012250	.000625	.010100	.002475	
40, 300	80, 600	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section....................pounds.	53, 000
Compression per inch under stress at elastic limit....................inch..	0. 001775
Ultimate strength per square inch of original section....................pounds..	80, 600
Manner of failure..	triple flexure

No. 490.

Compression Test.

Marks on bar, $\overset{\text{C T 2}}{\text{Inside}}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000175	.000175	0.	....	
5, 000	10, 000	.000300	.000125	0.	....	
7, 500	15, 000	.000525	.000225	0.	....	
10, 000	20, 000	.000750	.000225	0.	....	
12, 500	25, 000	.000925	.000175	0.	....	
15, 000	30, 000	.001025	.000100	0.	....	
17, 500	35, 000	.001225	.000200	.000025	.000025	
20, 000	40, 000	.001475	.000250	.000100	.000075	
20, 500	41, 000	.001500	.000025	....	....	
21, 000	42, 000	.001500	0.	....	....	
21, 500	43, 000	.001525	.000025	....	....	
22, 000	44, 000	.001525	.0	....	....	
22, 500	45, 000	.001550	.000025	.000100	0.	
23, 000	46, 000	.001600	.000050	.........?..	....	
23, 500	47, 000	.001650	.000050	....	....	
24, 000	48, 000	.001725	.000075	....	....	
24, 500	49, 000	.001750	.000025	....	....	
25, 000	50, 000	.001750	0.	.000125	.000025	Elastic limit.
25, 500	51, 000	{ .001750 { .005500	0. .003775	....	....	
26, 000	52, 000	.010750	.005250	....	....	
26, 500	53, 000	.013375	.002625	....	....	
27, 000	54, 000	.013775	.000400	....	....	
27, 500	55, 000	.014550	.000775	.012350	.012225	
28, 000	56, 000	.015200	.000650	....	....	
28, 500	57, 000	.015750	.000550	....	....	
29, 000	58, 000	.016800	.001050	....	....	
29, 500	59, 000	.017875	.001075	....	....	
30, 000	60, 000	.019175	.001300	.017000	.004650	
39, 200	78, 400	... .	....	....	....	Ultimate strength.

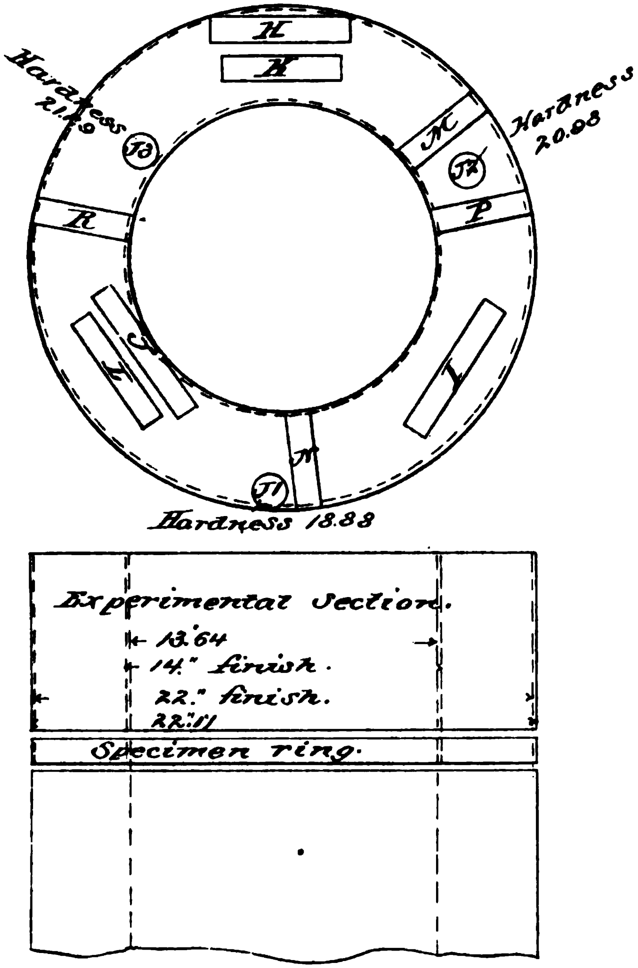
General summary.

Elastic limit per square inch of original section ....pounds..	50, 000
Compression per inch under stress at elastic limit ....inch..	0. 001750
Ultimate strength per square inch of original section ....pounds..	78, 400
Manner of failure..	triple flexure

8" Steel B. L. Rifle.

Jacket cylinder.

Experimental Section.



Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total,	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
14,500	58,000	.011833	.000933	....	....	
14,750	59,000	.012567	.000734	....	....	
15,000	60,000	.013767	.001200	.011560	.003767	
15,500	62,000	.014933	.001166	....	....	
16,000	64,000	.017100	.002167	....	....	
16,500	66,000	.019067	.001967	....	....	
17,000	68,000	.021000	.001933	....	....	
17,500	70,000	.023267	.002267	....	....	
18,000	72,000	.025600	.002333	....	....	
18,500	74,000	.028000	.002400	....	....	
19,000	76,000	.031333	.003333	....	....	
19,500	78,000	.034600	.003267	....	....	
20,000	80,000	.037667	.003067	....	....	
20,500	82,000	.042000	.004333	....	....	
21,000	84,000	.047667	.005667	....	....	
21,500	86,000	.053733	.006066	....	....	
22,000	88,000	.061600	.007867	....	....	Micrometer removed.
22,500	90,000	.0783	.0117	....	....	
23,000	92,000	.0933	.0200	————	....	
23,200	92,800	.1000	.0067	....	....	Minimum diameter ".533.
23,320	93,280	....	....	....	....	Ultimate strength.
....	....	.1300	.0300	....	....	Minimum diameter ".521.
....	....	.1533	.0233	....	....	Minimum diameter ".512.
						While sustaining the maximum load, the stretching going on in the mean time from ".1300 to ".1533 per inch.
20,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	....	7.8601
Hardness	....	18.58
Tensile strength per square inch of original section	pounds..	93,280
Elastic limit per square inch of original section	do....	52,800
Elongation per inch after rupture	inch..	0.20
Elongation per inch under strain at elastic limit	do ...	.001600
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section	....	36.4
Position of rupture	....	".70 from neck

Character of broken surface............fine granular, radiating from a dull spot at circumference. The minimum diameter (".44) occurred ".25 from the point of fracture.

Elongation of inch sections .... ".11, ".17 (".32 fractured section)

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
25,000	100,000	0.0733	0.0133			
25,500	102,000	.0833	.0100			
26,000	104,000	.1267	.0434			Ultimate strength.
22,700						Load at time of rupture.

General summary.

Tensile strength per square inch of original section........pounds.. 104,000
Elastic limit per square inch of original section........do.... 60,800
Elongation per inch after rupture........inch.. 0.21
Elongation per inch under strain at elastic limit........do.... .001800
Reduction in diameter at point of rupture........do.... .144
Reduction in area after rupture, per centum of original section........ 44.6
Position of rupture........".35 from middle of stem
Character of broken surface........silky, interspersed with fine granulation; cup-shaped ends
Elongation of inch sections........".17 (".34 fractured section), ".19

No. 355.

Tension Test.

Mark on bar, I
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000233	.000133	0.		
3,750	15,000	.000367	.000134	0.		
5,000	20,000	.000567	.000200	0.		
6,250	25,000	.000667	.000100	0.		
7,500	30,000	.000833	.000166	0.		
8,750	35,000	.000933	.000100	0.		
10,000	40,000	.001133	.000200	.000033	.000033	
10,250	41,000	.001167	.000034			
10,500	42,000	.001200	.000033			
10,750	43,000	.001233	.000033			
11,000	44,000	.001267	.000034			
11,250	45,000	.001300	.000033	.000067	.000034	
11,500	46,000	.001333	.000033			
11,750	47,000	.001367	.000034			
12,000	48,000	.001400	.000033			
12,250	49,000	.001433	.000033			
12,500	50,000	.001500	.000067	.000067	0.	
12,750	51,000	.001533	.000033			
13,000	52,000	.001567	.000034			
13,200	52,800	.001600	.000033			Elastic limit.
Rapid stretching; load suddenly fell to 50,000 pounds per square inch						
12,500	50,000	.002833 .003100	.001233 .000267			
12,750	51,000	.005000	.001900			
13,000	52,000	.007500	.002500			
13,250	53,000	.008167	.000667			
13,500	54,000	.009100	.000933			
13,750	55,000	.009767	.000667	.007733	.007666	
14,000	56,000	.010400	.000633			
14,250	57,000	.010900	.000500			

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
14,500	58,000	.011833	.000933	....	....	
14,750	59,000	.012567	.000734	....	....	
15,000	60,000	.013767	.001200	.011560	.003767	
15,500	62,000	.014933	.001166	....	....	
16,000	64,000	.017100	.002167	....	....	
16,500	66,000	.019067	.001967	....	....	
17,000	68,000	.021000	.001933	....	....	
17,500	70,000	.023267	.002267	....	....	
18,000	72,000	.025600	.002333	....	....	
18,500	74,000	.028000	.002400	....	....	
19,000	76,000	.031333	.003333	....	....	
19,500	78,000	.034600	.003267	....	....	
20,000	80,000	.037667	.003067	....	....	
20,500	82,000	.042000	.004333	....	....	
21,000	84,000	.047667	.005667	....	....	
21,500	86,000	.053733	.006066	....	....	
22,000	88,000	.061600	.007867	....	....	Micrometer removed.
22,500	90,000	.0733	.0117	....	....	
23,000	92,000	.0933	.0200	....	....	
23,200	92,800	.1000	.0067	....	....	Minimum diameter ".533.
23,320	93,280	....	....	....	....	Ultimate strength.
....	....	.1300	.0300	....	....	Minimum diameter ".521.
....	....	.1533	.0233	....	....	Minimum diameter ".512.
						While sustaining the maximum load, the stretching going on in the mean time from ".1300 to ".1533 per inch.
20,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity 7.8601
Hardness 18.58
Tensile strength per square inch of original section ....pounds.. 93,280
Elastic limit per square inch of original section ....do.... 52,800
Elongation per inch after rupture ....inch.. 0.20
Elongation per inch under strain at elastic limit ....do ... .001600
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section 36.4
Position of rupture .... ".70 from neck
Character of broken surface........fine granular, radiating from a dull spot at circumference. The minimum diameter (".44) occurred ".25 from the point of fracture.
Elongation of inch sections .... ".11, ".17 (".32 fractured section)

No. 356.

Tension Test.

Mark on bar, J
Diameter, ″.564.
Sectional area, .25 square inch.
Length 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	.000033	.000033	
2,500	10,000	.000300	.000167	.000033	0.	
3,750	15,000	.000433	.000133	.000033	0.	
5,000	20,000	.000633	.000200	.000033	0.	
6,250	25,000	.000767	.000134	.000033	0.	
7,500	30,000	.000967	.000200	.000033	0.	
8,750	35,000	.001100	.000133	.000033	0.	
10,000	40,000	.001300	.000200	.000067	.000034	
10,250	41,000	.001333	.000033			
10,500	42,000	.001333	0.			
10,750	43,000	.001367	.000034			
11,000	44,000	.001400	.000033			
11,250	45,000	.001433	.000033	.000067	.000033	
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	49,000	.001600	.000067			
12,500	50,000	.001633	.000033	.000100	.000033	
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001800	.000033	.000100	0.	
14,000	56,000	.001867	.000067			
14,250	57,000	.001900	.000033			
14,500	58,000	.001933	.000033			
14,750	59,000	.001967	.000034			
14,940	59,760	.002000	.000033			Elastic limit.
Rapid stretching; load suddenly fell to 56,000 pounds per square inch.						
14,000	56,000	.002700	.000700			
14,250	57,000	.002967	.000267			
14,500	58,000	.003333	.000366			
14,750	59,000	.006133	.002800			
15,000	60,000	.008567	.002434	.006300	.006200	
15,500	62,000	.009467	.000900			
16,000	64,000	.011300	.001833			
16,500	66,000	.013233	.001933			
17,000	68,000	.015267	.002034			
17,500	70,000	.016800	.001533			
18,000	72,000	.018833	.002033			
18,500	74,000	.021133	.002300			
19,000	76,000	.023533	.002400			
19,500	78,000	.026333	.002800			
20,000	80,000	.029100	.002767			
20,500	82,000	.032300	.003200			
21,000	84,000	.035700	.003400			
21,500	86,000	.040033	.004333			
22,000	88,000	.044367	.004334			
22,500	90,000	.051367	.007000			Micrometer removed.
23,000	92,000	.0633	.011933			
23,500	94,000	.0700	.0067			
24,000	96,000	.0933	.0233			
24,250	97,000	.1167 .1400	.0234 .0233			Ultimate strength.
21,600						Load at time of rupture.

General summary.

Tensile strength per square inch of original section..............pounds.. 97,000
Elastic limit per square inch of original section..............do ... 59,760
Elongation per inch after rupture..............inch.. 0.1733
Elongation per inch under strain at elastic limit..............do.... .002000
Reduction in diameter at point of rupture..............do.... .114
Reduction in area after rupture, per centum of original section.............. 36.4
Position of rupture.............. ″.75 from neck
Character of broken surface.........fine granular; radiating from a dull spot at circumference of bar
Elongation of inch sections.............. ″.10, ″.14 (″.28 fractured section).

No. 392.

Tension Test.

Mark on bar, P
Diameter, ".564.
Sectional area, .25 square inch.
Length, 2".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000050	.000050	0.	....	
2,500	10,000	.000150	.009100	0.	....	
3,750	15,000	.000300	.000150	0.	....	
5,000	20,000	,000500	.000200	0.	....	
6,250	25,000	.000600	.000100	0.	....	
7,500	30,000	.000900	.000300	0.	....	
7,750	31,000	.000900	0.	....	....	
8,000	32,000	.000950	.000050	....	....	
8,250	33,000	.000950	0.	....	....	
8,500	34,000	.001000	.000050	....	....	
8,750	35,000	.001050	.000050	0.	....	
9,000	36,000	.001100	.000050	....	....	
9,250	37,000	.001100	0.	....	....	
9,500	38,000	.001150	.000050	....	....	
9,750	39,000	.001150	0.	....	....	
10,000	40,000	.001250	.000100	0.	....	
10,250	41,000	.001250	0.	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001350	.000050	....	....	
11,000	44,000	.001350	0.	....	....	
11,250	45,000	.001400	.000050	0.	....	
11,500	46,000	.001450	.000050	....	....	
11,750	47,000	.001500	.000050	....	....	
12,000	48,000	.001500	0.	....	....	
12,250	49,000	.001550	.000050	....	....	
12,500	50,000	.001600	.000050	0.	....	
12,750	51,000	.001600	0.	....	....	
13,000	52,000	.001650	.000050	....	....	
13,250	53,000	.001700	.000050	....	....	Elastic limit.
13,500	54,000	.003400	.001700	....	....	
13,750	55,000	.004150	.000750	.002500	.002500	
14,000	56,000	.005050	.000900	....	....	
14,250	57,000	.005850	.000800	....	....	
14,500	58,000	.006650	.000800	....	....	
14,750	59,000	.007150	.000500	....	....	
15,000	60,000	.008500	.001350	.006150	.003650	
15,250	61,000	.008900	.000400	....	....	
15,500	62,000	.009600	.000700	....	....	
15,750	63,000	.010000	.000400	....	....	
16,000	64,000	.011050	.001050	....	....	
16,250	65,000	.011900	.000850	.009400	.003250	
16,500	66,000	.012600	.000700	....	....	
16,750	67,000	.013100	.000500	....	....	
17,000	68,000	.014200	.001100	....	....	
17,250	69,000	.014850	.000650	....	....	
17,500	70,000	.015900	.001050	.012450	.003050	
18,000	72,000	.017750	.001850	....	....	
18,500	74,000	.019100	.001350	....	....	
19,000	76,000	.021150	.002050	....	....	
19,500	78,000	.023400	.002250	....	....	
20,000	80,000	.025900	.002500	....	....	
20,500	82,000	.028900	.003000	....	....	
21,000	84,000	.030850	.001950	....	....	
21,500	86,000	.035100	.004250	....	....	
22,000	88,000	.037850	.002750	....	....	
22,500	90,000	.043000	.005150	....	....	
23,000	92,000	.047400	.004400	....	....	
23,500	94,000	.052050	.004650	....	....	
24,000	96,000	.059500	.007450	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24,500	98,000	0.069500	0.010000	....	....	
25,000	100,000	.087000	.017500	....	....	Micrometer removed.
25,140	100,560	.1150	.0280	....	....	Ultimate strength.
24,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................................pounds.. 100,560
Elastic limit per square inch of original section ....do ... 58,000
Elongation per inch after rupture ....inch.. 0.1200
Elongation per inch under strain at elastic limit ....do.... .001700
Reduction in diameter at point of rupture ....do.... .034
Reduction in area after rupture, per centum of original section 11.8
Position of rupture....................................".30 from neck
Character of broken surface ....granular; radiating from a point in the circumference
Elongation of inch sections....................................".09 (".15 fractured section).

No. 393.

Tension Test.

Mark on bar, R
Diameter, ".564.
Sectional area, .25 square inch.
Length, 2".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000400	.000200	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000750	.000150	0.	....	
7,500	30,000	.000900	.000150	0.	....	
7,750	31,000	.000900	0.	....	....	
8,000	32,000	.000950	.000050	....	....	
8,250	33,000	.001000	.000050	....	....	
8,500	34,000	.001050	.000050	....	....	
8,750	35,000	.001100	.000050	0.	....	
9,000	36,000	.001150	.000050	....	....	
9,250	37,000	.001150	0.	....	....	
9,500	38,000	.001200	.000050	....	....	
9,750	39,000	.001200	0.	....	....	
10,000	40,000	.001250	.000050	0.	....	
10,250	41,000	.001250	.0	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001300	0.	....	....	
11,000	44,000	.001350	.000050	....	....	
11,250	45,000	.001400	.000050	0.	....	
11,500	46,000	.001400	0.	....	....	
11,750	47,000	.001450	.000050	....	....	
12,000	48,000	.001450	0.	....	....	
12,250	49,000	.001500	.000050	....	....	
12,500	50,000	.001550	.000050	.000050	.000050	
12,750	51,000	.001600	.000050	....	....	Elastic limit.
13,000	52,000	.007150	.005550	....	....	
13,250	53,000	.008500	.001350	....	....	
13,500	54,000	.009100	.000600	....	....	
13,750	55,000	.009700	.000600	.007750	.007700	
14,000	56,000	.010500	.000800	....	....	

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
14,250	57,000	0.011100	0.000600	....	....	
14,500	58,000	.011900	.000800	....	....	
14,750	59,000	.012800	.000900	....	....	
15,000	60,000	.014000	.001200	0.011600	0.003850	
15,250	61,000	.014650	.000650	....	....	
15,500	62,000	.015900	.001250	....	....	
15,750	63,000	.017150	.001250	....	....	
16,000	64,000	.017900	.000750	....	....	
16,250	65,000	.018950	.001050	.016450	.004850	
16,500	66,000	.019950	.001000	....	....	
16,750	67,000	.021000	.001050	....	....	
17,000	68,000	.022150	.001150	....	....	
17,250	69,000	.023400	.001250	....	....	
17,500	70,000	.025250	.001850	.022850	.005900	
18,000	72,000	.028400	.003150	....	....	
18,500	74,000	.031650	.003250	....	....	
19,000	76,000	.034900	.003250	....	....	
19,500	78,000	.038650	.003750	....	....	
20,000	80,000	.042600	.003950	....	....	
20,500	82,000	.048000	.005400	....	....	
21,000	84,000	.055750	.007750	....	....	
21,500	86,000	.066000	.010250	....	....	Micrometer removed.
22,000	88,000	.0750	.0090	....	....	
22,500	90,000	.0950	.0200	....	....	
22,900	91,600	.1250	.0300	....	....	Ultimate strength.
21,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	91,600
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		at middle of stem
Character of broken surface		silky, 50 per centum; granular, 50 per centum; the bar separated first in the silky section.
Elongation of inch sections		".15 (".25 fractured section)

No. 386.

Compression Test.

Marks on bar, K
Length, 4''.98.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000050	.000050	0.	....	
5,000	10,000	.000225	.000175	0.	....	
7,500	15,000	.000375	.000150	0.	....	
10,000	20,000	.000525	.000150	0.	....	
12,500	25,000	.000725	.000200	0.	....	
15,000	30,000	.000900	.000175	0.	....	
17,500	35,000	.001000	.000100	0.	....	
20,000	40,000	.001200	.000200	0.	....	
20,500	41,000	.001225	.000025	....	....	
21,000	42,000	.001250	.000025	....	....	
21,500	43,000	.001275	.000025	....	....	
22,000	44,000	.001300	.000025	....	....	
22,500	45,000	.001325	.000025	0.	....	
23,000	46,000	.001350	.000025	....	....	
23,500	47,000	.001400	.000050	....	....	
24,000	48,000	.001450	.000050	....	....	
24,500	49,000	.001475	.000025	....	....	
25,000	50,000	.001500	.000025	0.	....	
25,500	51,000	.001525	.000025	....	....	
26,000	52,000	.001550	.000025	....	....	
26,500	53,000	.001625	.000075	....	....	
27,000	54,000	.001675	.000050	....	....	
27,500	55,000	.001700	.000025	0.	....	
28,000	56,000	.001750	.000050	....	....	
28,500	57,000	.001750	0.	....	....	
29,000	58,000	.001775	.000025	....	....	
29,500	59,000	.001775	0.	....	....	Elastic limit.
30,000	60,000	.002425	.000650	.000675	.000675	Rapid deflection.
30,500	61,000	.005375	.000950	.003675	.003000	Test discontinued.

General summary.

Elastic limit per square inch of original section .... pounds.. 59,000
Compression per inch under stress at elastic limit .... inch.. 0.001775

No. 387.

Compression Test.

Mark on bar, L
Length, 4''.97.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000150	.000150	0.	....	
5,000	10,000	.000275	.000125	0.	....	
7,500	15,000	.000425	.000150	0.	....	
10,000	20,000	.000525	.000100	0.	....	
12,500	25,000	.000700	.000175	0.	....	
15,000	30,000	.000925	.000225	0.	....	
17,500	35,000	.001025	.000100	0.	....	
20,000	40,000	.001200	.000175	0.	....	
20,500	41,000	.001223	.000025	....	....	
21,000	42,000	.001250	.000025	....	....	
21,500	43,000	.001275	.000025	....	....	
22,000	44,000	.001300	.000025	....	....	
22,500	45,000	.001325	.000025	0.	....	
23,000	46,000	.001400	.000075	....	....	
23,500	47,000	.001450	.000050	....	....	
24,000	48,000	.001475	.000025	....	....	
24,500	49,000	.001500	.000025	....	....	Elastic limit.
25,000	50,000	.005125	.003625	.003735	.003725	Rapid deflection.
25,500	51,000	.005950	.000825	....	....	
26,000	52,000	.007000	.001050	.005375	.001650	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	49,000
Compression per inch under stress at elastic limit	inch..	0.001500

No. 390.

Compression Test.

Mark on bar, M
Length, 3″.98.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000267	.000200	0.	....	
7,500	15,000	.000400	.000133	0.	....	
10,000	20,000	.000600	.000200	0.	....	
12,500	25,000	.000733	.000133	0.	....	
15,000	30,000	.000900	.000167	0.	....	
15,500	31,000	.000933	.000033	....	....	
16,000	32,000	.000967	.000034	....	....	
16,500	33,000	.001000	.000033	....	....	
17,000	34,000	.001033	.000033	....	....	
17,500	35,000	.001067	.000034	.000033	.000033	
18,000	36,000	.001100	.000033	....	....	
18,500	37,000	.001133	.000033	....	....	
19,000	38,000	.001167	.000034	....	....	
19,500	39,000	.001200	.000033	....	....	
20,000	40,000	.001233	.000033	.000033	0.	
20,500	41,000	.001267	.000034	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001400	.000033	.000033	0.	
23,000	46,000	.001400	0.	....	....	
23,500	47,000	.001433	.000033	....	....	
24,000	48,000	.001467	.000034	....	....	
24,500	49,000	.001567	.000100	....	....	
25,000	50,000	.001600	.000033	.000033	0.	
25,500	51,000	.001600	0.	....	....	
26,000	52,000	.001633	.000033	....	....	
26,500	53,000	.001667	.000034	....	....	
27,000	54,000	.001700	.000033	....	....	
27,500	55,000	.001733	.000033	.000033	0.	
28,000	56,000	.001733	0.	....	....	
28,500	57,000	.001800	.000067	....	....	Elastic limit.
29,000	58,000	.004167	.002367	....	....	
29,500	59,000	.004633	.000466	....	....	
30,000	60,000	.005267	.000634	.003067	.003034	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	57,000
Compression per inch under stress at elastic limit	inch..	0.001800

No. 391.

Compression Test.

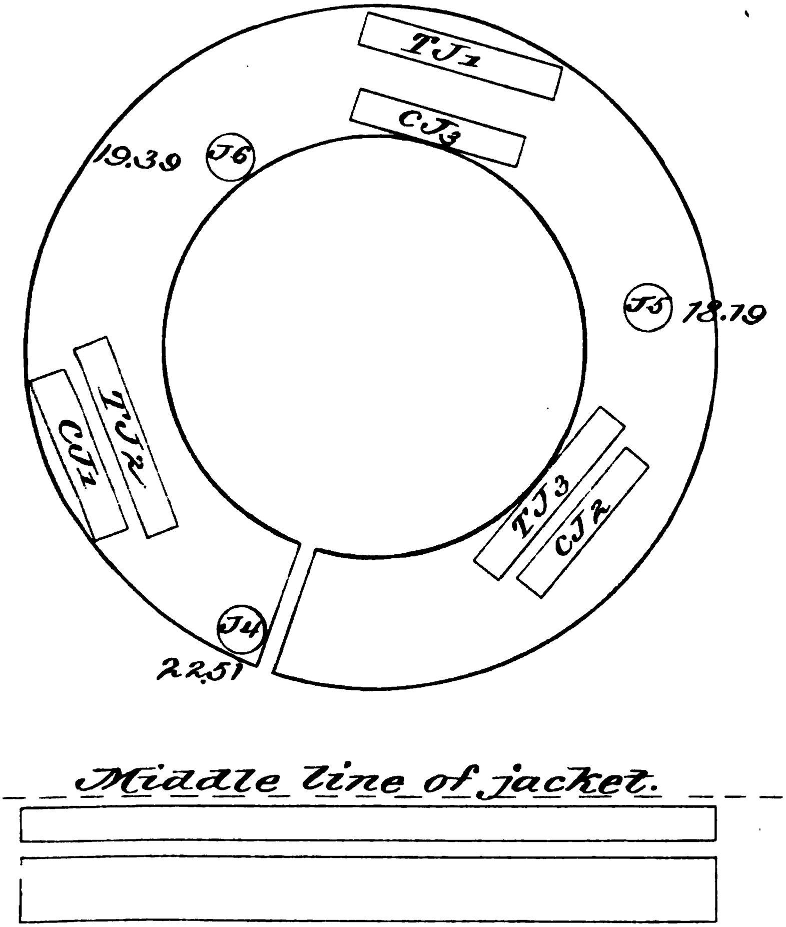
Mark on bar, N
Length, 3''.98.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000100	.000100	0.	....	
5, 000	10, 000	.000300	.000200	0.	....	
7, 500	15, 000	.000433	.000133	0.	....	
10, 000	20, 000	.000633	.000200	.000033	.000033	
12, 500	25, 000	.000767	.000134	.000033	0.	
15, 000	30, 000	.000967	.000200	.000033	0.	
15, 500	31, 000	.000967	0.	....	....	
16, 000	32, 000	.001000	.000033	....	....	
16, 500	33, 000	.001000	0.	....	....	
17, 000	34, 000	.001033	.000033	....	....	
17, 500	35, 000	.001067	.000034	.000033	0.	
18, 000	36, 000	.001133	.000066	....	....	
18, 500	37, 000	.001200	.000067	....	....	
19, 000	38, 000	.001233	.000033	....	....	
19, 500	39, 000	.001267	.000034	....	....	
20, 000	40, 000	.001300	.000033	.000033	0.	
20, 500	41, 000	.001300	0.	....	....	
21, 000	42, 000	.001333	.000033	....	....	
21, 500	43, 000	.001367	.000034	....	....	
22, 000	44, 000	.001367	0.	....	....	
22, 500	45, 000	.001400	.000033	.000033	0.	
23, 000	46, 000	.001433	.000033	....	....	
23, 500	47, 000	.001500	.000067	....	....	
24, 000	48, 000	.001600	.000100	....	....	
24, 500	49, 000	.001600	0.	....	....	
25, 000	50, 000	.001600	0.	.000033	0.	
25, 500	51, 000	.001633	.000033	....	....	
26, 000	52, 000	.001667	.000034	....	....	
26, 500	53, 000	.001700	.000033	....	....	
27, 000	54, 000	{.001733 {.005733	.000033 .004000	....	....	Elastic limit. Sudden yielding.
27, 500	55, 000	.007233	.001500	.005267	.005234	
28, 000	56, 000	.007833	.000600	....	....	
28, 500	57, 000	.008367	.000534	....	....	
29, 000	58, 000	.009033	.000666	....	....	
29, 500	59, 000	.009700	.000667	....	....	
30, 000	60, 000	.010367	.000667	.008133	.002866	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	54, 000
Compression per inch under stress at elastic limit	inch..	0. 001733

8" Steel B.L. Rifle.
Jacket cylinder.
Experimental Section.
Location of specimens taken out after unhooping.



S Ex 36 49 1

No. 592.

Marks, T J_1
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000400	.000167	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000700	.000133	0.	....	
7, 500	30, 000	.000900	.000200	0.	....	
8, 750	35, 000	.001033	.000133	0.	....	
10, 000	40, 000	.001200	.000167	0.	....	
10, 250	41, 000	.001300	.000100	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001367	0.	....	....	
14, 250	45, 000	.001400	.000033	0.	....	
11, 500	46, 000	.001433	.000033	....	....	
11, 750	47, 000	.001467	.000034	....	....	
12, 000	48, 000	.001500	.000033	....	....	
12, 250	49 000	.001533	.000033	....	....	Elastic limit.
12, 500	50, 000	.012700	.001167	.010633	.010633	
12, 750	51, 000	.013100	.000400	....	....	
13, 000	52, 000	.013600	.000500	....	....	
13, 250	53, 000	.014100	.000500	....	....	
13, 500	54, 000	.015100	.001000	....	....	
13, 750	55, 000	.016333	.001233	.014233	.003600	
14, 000	56, 000	.017700	.001367	....	....	
14, 250	57, 000	.018400	.000700	....	....	
14, 500	58, 000	.019433	.001033	....	....	
14, 750	59, 000	.020100	.000967	....	....	
15, 000	60, 000	.021900	.001500	.019600	.005367	
15, 500	62, 000	.024067	.002167	....	....	
16, 000	64, 000	.026600	.002533	....	....	
16, 500	66, 000	.029733	.003133	....	....	
17, 000	68, 000	.032333	.002600	....	....	
17, 500	70, 000	.036000	.003667	....	....	
18, 000	72, 000	.040033	.004033	....	....	
18, 500	74, 000	.044667	.004634	....	....	
19, 000	76, 000	.048933	.004266	....	....	
19, 500	78, 000	.055033	.006100	....	....	
20, 000	80, 000	.062333	.007300	....	....	
20, 500	82, 000	.072000	.009667	....	....	
21, 000	84, 000	.086667	.014667	....	....	
21, 500	86, 000	.104000	.017333	....	....	
22, 000	88, 000	.146667	.042667	....	....	
22, 040	88, 160	.1900	.053333	....	....	Tensile strength.
19, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88, 160
Elastic limit per square inch of original section	do....	49, 000
Elongation per inch after rupture	inch..	.2500
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".3 from middle of stem
Character of broken surface		fine silky
Elongation of inch sections		".14, ".41*, ".20

No. 593.

Marks, T J_2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	—.000067	—.000067	
2,500	10,000	.000133	.000133	—.000067	0.	
3,750	15,000	.000267	.000134	—.000067	0.	
5,000	20,000	.000400	.000133	—.000067	0.	
6,250	25,000	.000567	.000167	—.000067	0.	
7,500	30,000	.000733	.000166	—.000067	0.	
8,750	35,000	.000867	.000134	—.000067	0.	
10,000	40,000	.001033	.000166	—.000067	0.	
10,250	41,000	.001100	.000067	....	....	
10,500	42,000	.001133	.000033	....	....	
10,750	43,000	.001167	.000034	....	....	
11,000	44,000	.001200	.000033	....	....	
11,250	45,000	001233	.000033	—.000067	0.	
11,500	46,000	.001267	.000034	....	....	
11,750	47,000	.001300	.000033	....	....	
12,000	48,000	.001333	.000033	....	....	
12,250	49,000	.001367	.000034	....	....	
12,500	50,000	.001400	.000033	—.000067	0.	
12,750	51,000	.001500	.000100	....	....	Elastic limit.
13,000	52,000	.002833	.001333	....	....	
13,250	53,000	.006667	.003834	....	....	
13,500	54,000	.008833	.002166	....	....	
13,750	55,000	.009300	.000467	.007067	.007134	
14,000	56,000	.010267	.000967	....	....	
14,250	57,000	.010533	.000266	....	....	
14,500	58,000	.011267	.000734	....	....	
14,750	59,000	.012000	.000733	....	....	
15,000	60,000	.013067	.001067	.010600	.003533	
15,500	62,000	.014767	.001700	....	....	
16,000	64,000	.016600	.001833	....	....	
16,500	66,000	.018000	.001400	....	....	
17,000	68,000	.020500	.002500	....	....	
17,500	70,000	.023333	.002833	....	....	
18,000	72,000	.025367	.002034	....	....	
18,500	74,000	.027967	.002600	....	....	
19,000	76,000	.030667	.002700	....	....	
19,500	78,000	.034267	.003600	....	....	
20,000	80,000	.037267	.003000	....	....	
20,500	82,000	.041333	.004066	....	....	
21,000	84,000	.046167	.004834	....	....	
21,500	86,000	.051833	.005666	....	....	
22,000	88,000	.058500	.006667	....	....	
22,500	90,000	.066500	.008000	....	....	
23,000	92,000	.078333	.011833	....	....	
23,500	94,000	.1000	.021667	....	....	
23,850	95,400	.1467	.0467	....	....	Tensile strength.
21,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	95,400
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0 2167
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.3 from middle of stem
Character of broken surface		fine, silky
Elongation of inch sections		″.18, ″.35*, ″.12

No. 594.

Marks, T J,
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000300	.000133	0.		
3,750	15,000	.000467	.000167	0.		
5,000	20,000	.000633	.000166	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.000967	.000167	0.		
8,750	35,000	.001100	.000133	.000033	.000033	
10,000	40,000	.001267	.000167	.000033	0.	
10,250	41,000	.001300	.000033			
10,500	42,000	.001367	.000067			
10,750	43,000	.001400	.000033			
11,000	44,000	.001400	0.			
11,250	45,000	.001433	.000033	.000033	0.	
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	49,000	.001567	.000034			
12,500	50,000	.001633	.000066	.000033	0.	
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			
13,750	55,000	.001800	.000033	.000067	.000034	
14,000	56,000	.001833	.000033			
14,250	57,000	.001867	.000034			
14,500	58,000	.001933	.000066			
14,750	59,000	.002033	.000100			Elastic limit.
15,000	60,000	.002600	.000567	.000633	.000566	
15,250	61,000	.003533	.000933			
15,500	62,000	.004600	.001067			
15,750	63,000	.006233	.001633			
16,000	64,000	.007767	.001534			
16,500	66,000	.009267	.001500			
17,000	68,000	.010500	.001233			
17,500	70,000	.012167	.001667			
18,000	72,000	.013600	.001433			
18,500	74,000	.015400	.001800			
19,000	76,000	.017000	.001600			
19,500	78,000	.018733	.001733			
20,000	80,000	.020433	.001700			
20,500	82,000	.022267	.001834			
21,000	84,000	.024500	.002233			
21,500	86,000	.027000	.002500			
22,000	88,000	.029667	.002667			
22,500	90,000	.032100	.002433			
23,000	92,000	.034933	.002833			
23,500	94,000	.038333	.003400			
24,000	96,000	.042833	.004500			
24,500	98,000	.047233	.004400			
25,000	100,000	.052000	.004767			
25,500	102,000	.0533	.0013			
26,000	104,000	.0700	.0167			
26,500	106,000	.0833	.0133			
26,760	107,040	.1167	.0334			Tensile strength.
25,100						Load at time of rupture.

General summary.

Tensile strength per square inch of original section.......pounds..	107,040
Elastic limit per square inch of original section.......do....	59,000
Elongation per inch after rupture.......inch..	0.1500
Elongation per inch under strain at elastic limit.......do...	.002033
Reduction in diameter at point of rupture.......do...	.094
Reduction in area after rupture, per centum of original section.......	30.6
Position of rupture.......	″.70 from neck
Character of broken surface.......	fine granular, radiating from a dull spot at circumference
Elongation of inch sections.......	″.25,* ″.11, ″.09

No. 486.

Compression Test.

Marks on bar, C J$_1$ Outside
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000025	.000025	0.	....	
5,000	10,000	.000125	.000100	0.	....	
7,500	15,000	.000275	.000150	0.	....	
10,000	20,000	.000525	.000250	0.	....	
12,500	25,000	.000675	.000150	0.	....	
15,000	30,000	.000800	.000125	0.	....	
17,500	35,000	.001025	.000225	0.	....	
20,000	40,000	.001175	.000150	0.	....	
20,500	41,000	.001200	.000025	....	....	
21,000	42,000	.001225	.000025	....	....	
21,500	43,000	.001225	0.	....	....	
22,000	44,000	.001250	.000025	....	....	
22,500	45,000	.001275	.000025	0.	....	
23,000	46,000	.001300	.000025	....	....	
23,500	47,000	.001325	.000025	....	....	
24,000	48,000	.001350	.000025	....	....	
24,500	49,000	.001375	.000025	....	....	
25,000	50,000	.001425	.000050	0.	....	
25,500	51,000	.001450	.000025	....	....	
26,000	52,000	.001500	.000050	....	....	
26,500	53,000	.001525	.000025	....	....	
27,000	54,000	.001575	.000050	....	....	
27,500	55,000	.001600	.000025	0.	....	
28,000	56,000	.001650	.000050	....	....	
28,500	57,000	.001700	.000050	....	....	Elastic limit.
29,000	58,000	.001875	.000175	....	....	
29,500	59,000	.009000	.007125	....	....	
30,000	60,000	.009700	.000700	.007650	.007650	
44,380	88,760	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section .... pounds..	57,000
Compression per inch under stress at elastic limit .... inch..	0.001700
Ultimate strength per square inch of original section .... pounds..	88,760
Manner of failure	triple flexure

Bent 180° without fracture.

No. 487.

Compression Test.

Marks on bar, $\overset{\text{C J}_3}{\text{Middle}}$.
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000125	.000125	0.	....	
5,000	10,000	.000275	.000150	0.	....	
7,500	15,000	.000525	.000250	0.	....	
10,000	20,000	.000650	.000125	0.	....	
12,500	25,000	.000775	.000125	0.	....	
15,000	30,000	.001000	.000225	0.	....	
17,500	35,000	.001125	.000125	0.	....	
20,000	40,000	.001275	.000150	0.	....	
20,500	41,000	.001275	.0	....	....	
21,000	42,000	.001300	.000025	....	....	
21,500	43,000	.001350	.000050	....	....	
22,000	44,000	.001400	.000050	....	....	
22,500	45,000	.001450	.000050	0.	....	
23,000	46,000	.001500	.000050	....	....	
23,500	47,000	.001525	.000025	....	....	
24,000	48,000	.001575	.000050	....	....	
24,500	49,000	.001575	0.	....	....	
25,000	50,000	.001600	.000025	0.	....	
25,500	51,000	.001650	.000050	....	....	
26,000	52,000	.001700	.000050	....	....	
26,500	53,000	.001725	.000025	....	....	
27,000	54,000	.001775	.000050	....	....	
27,500	55,000	.001825	.000050	.000050	.000050	Elastic limit.
28,000	56,000	.007725	.005900	....	....	
28,500	57,000	.008175	.000450	....	....	
29,000	58,000	.008650	.000475	....	....	
29,500	59,000	.009300	.000650	....	....	
30,000	60,000	.009925	.000625	.007825	.007775	
43,920	87,840	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	55,000
Compression per inch under stress at elastic limit	inch..	0.001825
Ultimate strength per square inch of original section	pounds..	87,840
Manner of failure		triple flexure

Bent 180° without fracture.

No. 592.

Marks, T J_1
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001033	.000133	0.	....	
10,000	40,000	.001200	.000167	0.	....	
10,250	41,000	.001300	.000100	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001367	0.	....	....	
14,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001533	.000033	....	....	Elastic limit.
12,500	50,000	.012700	.001167	.010633	.010633	
12,750	51,000	.013100	.000400	....	....	
13,000	52,000	.013600	.000500	....	....	
13,250	53,000	.014100	.000500	....	....	
13,500	54,000	.015100	.001000	....	....	
13,750	55,000	.016333	.001233	.014233	.003600	
14,000	56,000	.017700	.001367	....	....	
14,250	57,000	.018400	.000700	....	....	
14,500	58,000	.019433	.001033	....	....	
14,750	59,000	.020400	.000967	....	....	
15,000	60,000	.021900	.001500	.019600	.005367	
15,500	62,000	.024067	.002167	....	....	
16,000	64,000	.026600	.002533	....	....	
16,500	66,000	.029733	.003133	....	....	
17,000	68,000	.032333	.002600	....	....	
17,500	70,000	.036000	.003667	....	....	
18,000	72,000	.040033	.004033	....	....	
18,500	74,000	.044667	.004634	....	....	
19,000	76,000	.048933	.004266	....	....	
19,500	78,000	.055033	.006100	....	....	
20,000	80,000	.062333	.007300	....	....	
20,500	82,000	.072000	.009667	....	....	
21,000	84,000	.086667	.014667	....	....	
21,500	86,000	.104000	.017333	....	....	
22,000	88,000	.146667	.042667	....	....	
22,040	88,160	.1900	.053333	....	....	Tensile strength.
19,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 88,160
Elastic limit per square inch of original section..............................do.... 49,000
Elongation per inch after rupture..............................inch.. .2500
Elongation per inch under strain at elastic limit..............................do.... .001533
Reduction in diameter at point of rupture..............................do.... .154
Reduction in area after rupture, per centum of original section.............................. 47.2
Position of rupture.............................. ″.3 from middle of stem
Character of broken surface..............................fine silky
Elongation of inch sections..............................″.14, ″.41*, ″.20

No. 593.

Marks, T J_2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	—.000067	—.000067	
2,500	10,000	.000133	.000133	—.000067	0.	
3,750	15,000	.000267	.000134	—.000067	0.	
5,000	20,000	.000400	.000133	—.000067	0.	
6,250	25,000	.000567	.000167	—.000067	0.	
7,500	30,000	.000733	.000166	—.000067	0.	
8,750	35,000	.000867	.000134	—.000067	0.	
10,000	40,000	.001033	.000166	—.000067	0.	
10,250	41,000	.001100	.000067	....	....	
10,500	42,000	.001133	.000033	....	....	
10,750	43,000	.001167	.000034	....	....	
11,000	44,000	.001200	.000033	....	....	
11,250	45,000	001233	.000033	—.000067	0.	
11,500	46,000	.001267	.000034	....	....	
11,750	47,000	.001300	.000033	....	....	
12,000	48,000	.001333	.000033	....	....	
12,250	49,000	.001367	.000034	....	....	
12,500	50,000	.001400	.000033	—.000067	0.	
12,750	51,000	.001500	.000100	....	....	Elastic limit.
13,000	52,000	.002833	.001333	....	....	
13,250	53,000	.006667	.003834	....	....	
13,500	54,000	.008833	.002166	....	....	
13,750	55,000	.009300	.000467	.007067	.007134	
14,000	56,000	.010267	.000967	....	....	
14,250	57,000	.010533	.000266	....	....	
14,500	58,000	.011267	.000734	....	....	
14,750	59,000	.012000	.000733	....	....	
15,000	60,000	.013067	.001067	.010600	.003533	
15,500	62,000	.014767	.001700	....	....	
16,000	64,000	.016600	.001833	....	....	
16,500	66,000	.018000	.001400	....	....	
17,000	68,000	.020500	.002500	....	....	
17,500	70,000	.023333	.002833	....	....	
18,000	72,000	.025367	.002034	....	....	
18,500	74,000	.027967	.002600	....	....	
19,000	76,000	.030667	.002700	....	....	
19,500	78,000	.034267	.003600	....	....	
20,000	80,000	.037267	.003000	....	....	
20,500	82,000	.041333	.004066	....	....	
21,000	84,000	.046167	.004834	....	....	
21,500	86,000	.051833	.005666	....	....	
22,000	88,000	.058500	.006667	....	....	
22,500	90,000	.066500	.008000	....	....	
23,000	92,000	.078333	.011833	....	....	
23,500	94,000	.1000	.021667	....	....	
23,850	95,400	.1467	.0467	....	....	Tensile strength.
21,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	95,400
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.001500
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.3 from middle of stem
Character of broken surface		fine, silky
Elongation of inch sections		″.18, ″.35*, ″.13

No. 594.

Marks, T J,
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10. 000	.000300	.000133	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001100	.000133	.000033	.000033	
10, 000	40, 000	.001267	.000167	.000033	0.	
10, 250	41, 000	.001300	.000033	....	....	
10, 500	42, 000	.001367	.000067	....	....	
10, 750	43, 000	.001400	.000033	....	....	
11, 000	44, 000	.001400	0.	....	....	
11, 250	45, 000	.001433	.000033	.000033	0.	
11, 500	46, 000	.001467	.000034	....	....	
11, 750	47, 000	.001500	.000033	....	....	
12, 000	48, 000	.001533	.000033	....	....	
12, 250	49, 000	.001567	.000034	....	....	
12, 500	50, 000	.001633	.000066	.000033	0.	
12, 750	51, 000	.001667	.000034	....	....	
13, 000	52, 000	.001700	.000033	....	....	
13, 250	53, 000	.001733	.000033	....	....	
13, 500	54, 000	.001767	.000034	....	....	
13, 750	55, 000	.001800	.000033	.000067	.000034	
14, 000	56, 000	.001833	.000033	....	....	
14, 250	57, 000	.001867	.000034	....	....	
14, 500	58, 000	.001933	.000066	....	....	
14, 750	59, 000	.002033	.000100	....	....	Elastic limit.
15, 000	60, 000	.002600	.000567	.000633	.000566	
15, 250	61, 000	.003533	.000933	....	....	
15, 500	62, 000	.004600	.001067	....	....	
15, 750	63, 000	.006233	.001633	....	....	
16, 000	64, 000	.007767	.001534	....	....	
16, 500	66, 000	.009267	.001500	....	....	
17, 000	68, 000	.010500	.001233	....	....	
17. 500	70, 000	.012167	.001667	....	....	
18, 030	72, 000	.013600	.001433	....	....	
18, 500	74, 000	.015400	.001800	....	....	
19, 000	76, 000	.017000	.001600	....	....	
19, 500	78, 000	.018733	.001733	....	....	
20, 000	80, 000	.020433	.001700	....	....	
20, 500	82, 000	.022267	.001834	....	....	
21, 000	84, 000	.024500	.002233	....	....	
21, 500	86, 000	.027000	.002500	....	....	
22, 000	88, 000	.029667	.002667	....	....	
22, 500	90, 000	.032100	.002433	....	....	
23, 000	92, 000	.034933	.002833	....	....	
23, 500	94, 000	.038333	.003400	....	....	
24, 000	96, 000	.042833	.004500	....	....	
24, 500	98, 000	.047233	.004400	....	....	
25, 000	100, 000	.052000	.004767	....	....	
25, 500	102, 000	.0533	.0013	....	....	
26, 000	104, 000	.0700	.0167	....	....	
26, 500	106, 000	.0833	.0133	....	....	
26, 760	107, 040	.1167	.0334	....	....	Tensile strength.
25, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	107, 040
Elastic limit per square inch of original section	do	59, 000
Elongation per inch after rupture	inch	0. 1500
Elongation per inch under strain at elastic limit	do	.002033
Reduction in diameter at point of rupture	do	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		″.70 from neck
Character of broken surface		fine granular, radiating from a dull spot at circumference
Elongation of inch sections		″.25,* ″.11, ″.09

No. 486.

Compression Test.

Marks on bar, $\overset{\text{C J}_1}{\text{Outside}}$
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000025	.000025	0.	....	
5,000	10,000	.000125	.000100	0.	....	
7,500	15,000	.000275	.000150	0.	....	
10,000	20,000	.000525	.000250	0.	....	
12,500	25,000	.000675	.000150	0.	....	
15,000	30,000	.000800	.000125	0.	....	
17,500	35,000	.001025	.000225	0.	....	
20,000	40,000	.001175	.000150	0.	....	
20,500	41,000	.001200	.000025	....	....	
21,000	42,000	.001225	.000025	....	....	
21,500	43,000	.001225	0.	....	....	
22,000	44,000	.001250	.000025	....	....	
22,500	45,000	.001275	.000025	0.	....	
23,000	46,000	.001300	.000025	....	....	
23,500	47,000	.001325	.000025	....	....	
24,000	48,000	.001350	.000025	....	....	
24,500	49,000	.001375	.000025	....	....	
25,000	50,000	.001425	.000050	0.	....	
25,500	51,000	.001450	.000025	....	....	
26,000	52,000	.001500	.000050	....	....	
26,500	53,000	.001525	.000025	....	....	
27,000	54,000	.001575	.000050	....	....	
27,500	55,000	.001600	.000025	0.	....	
28,000	56,000	.001650	.000050	....	....	
28,500	57,000	.001700	.000050	....	....	Elastic limit.
29,000	58,000	.001875	.000175	....	....	
29,500	59,000	.009000	.007125	....	....	
30,000	60,000	.009700	.000700	.007650	.007650	
44,380	88,760	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	57,000
Compression per inch under stress at elastic limit	inch..	0.001700
Ultimate strength per square inch of original section	pounds..	88,760
Manner of failure		triple flexure

Bent 180° without fracture.

No. 487.

Compression Test.

Marks on bar, $\frac{C\ J_2}{\text{Middle}}$.
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000125	.000125	0.	....	
5,000	10,000	.000275	.000150	0.	....	
7,500	15,000	.000525	.000250	0.	....	
10,000	20,000	.000650	.000125	0.	....	
12,500	25,000	.000775	.000125	0.	....	
15,000	30,000	.001000	.000225	0.	....	
17,500	35,000	.001125	.000125	0.	....	
20,000	40,000	.001275	.000150	0.	....	
20,500	41,000	.001275	.0	....	....	
21,000	42,000	.001300	.000025	....	....	
21,500	43,000	.001350	.000050	....	....	
22,000	44,000	.001400	.000050	....	....	
22,500	45,000	.001450	.000050	0.	....	
23,000	46,000	.001500	.000050	....	....	
23,500	47,000	.001525	.000025	....	....	
24,000	48,000	.001575	.000050	....	....	
24,500	49,000	.001575	0.	....	....	
25,000	50,000	.001600	.000025	0.	....	
25,500	51,000	.001650	.000050	....	....	
26,000	52,000	.001700	.000050	....	....	
26,500	53,000	.001725	.000025	....	....	
27,000	54,000	.001775	.000050	....	....	
27,500	55,000	.001825	.000050	.000050	.000050	Elastic limit.
28,000	56,000	.007725	.005900	....	....	
28,500	57,000	.008175	.000450	....	....	
29,000	58,000	.008650	.000475	....	....	
29,500	59,000	.009300	.000650	....	....	
30,000	60,000	.009925	.000625	.007825	.007775	
43,920	87,840	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	55,000
Compression per inch under stress at elastic limit	inch..	0.001825
Ultimate strength per square inch of original section	pounds..	87,840
Manner of failure		triple flexure

Bent 180° without fracture.

No. 488.

Compression Test.

Marks on bar, $\frac{\text{C J}_3}{\text{Inside}}$

Length, 5″.

Diameter, ″.798.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000125	.000125	0.	....	
5,000	10,000	.000275	.000150	0.	....	
7,500	15,000	.000525	.000250	0.	....	
10,000	20,000	.000725	.000200	0.	....	
12,500	25,000	.000850	.000125	0.	....	
15,000	30,000	.001025	.000175	0.	....	
17,500	35,000	.001200	.000175	0.	....	
20,000	40,000	.001375	.000175	0.	....	
20,500	41,000	.001400	.000025	....	....	
21,000	42,000	.001425	.000025	....	....	
21,500	43,000	.001475	.000050	....	....	
22,000	44,000	.001500	.000025	....	....	
22,500	45,000	.001525	.000025	0.	....	
23,000	46,000	.001550	.000025	....	....	
23,500	47,000	.001575	.000025	....	....	
24,000	48,000	.001625	.000050	....	....	
24,500	49,000	.001650	.000025	....	....	
25,000	50,000	.001700	.000050	0.	....	
25,500	51,000	.001725	.000025	....	....	
26,000	52,000	.001775	.000050	....	....	
26,500	53,000	.001800	.000025	....	....	
27,000	54,000	.001825	.000025	....	....	
27,500	55,000	.001850	.000025	0.	....	
28,000	56,000	.001900	.000050	....	....	
28,500	57,000	.001925	.000025	....	....	
29,000	58,000	.001950	.000025	....	....	Elastic limit.
29,500	59,000	.005725	.003775	....	....	
30,000	60,000	.008500	.002775	.006500	.006500	
43,960	87,920	....	....	....	....	Ultimate strength.

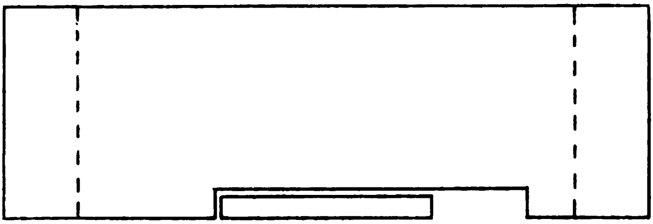
General summary.

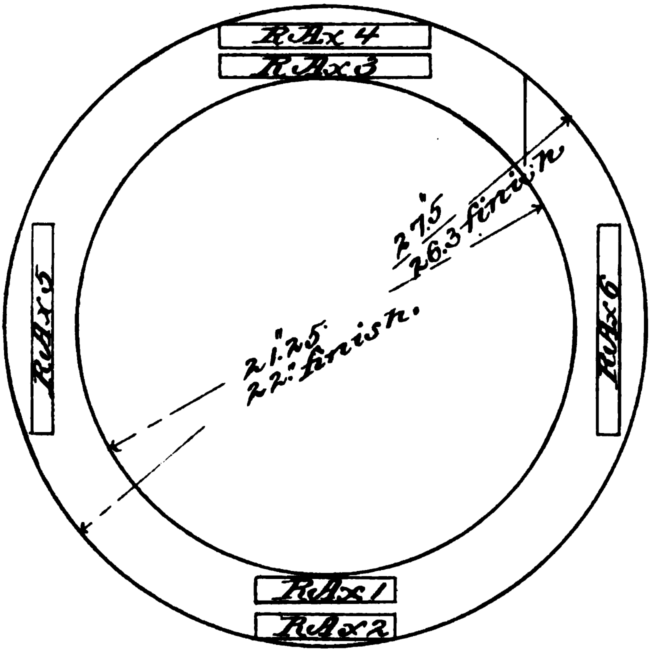
Elastic limit per square inch of original section	pounds..	58,000
Compression per inch under stress at elastic limit	inch..	0.001950
Ultimate strength, per square inch of original section	pounds..	87,920
Manner of failure		triple flexure

8" Steel B. L. Rifle.

Hoop Ax

Experimental Section.





S Ex 36 49 1

No. 320.

Tension Test.

Marks on bar, $\underset{1}{\text{R A X}}$
Diameter, ″.564
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000417	.000167	.000033	.000033	
5,000	20,000	.000550	.000133	.000050	.000017	
6,250	25,000	.000700	.000150	.000050	0.	
6,500	26,000	.000750	.000050	....	....	
6,750	27,000	.000767	.000017	....	....	
7,000	28,000	.000783	.000016	....	....	
7,250	29,000	.000817	.000034	....	....	
7,500	30,000	.000833	.000016	.000050	0.	
7,750	31,000	.000867	.000034	....	....	
8,000	32,000	.000917	.000050	....	....	
8,250	33,000	.000950	.000033	....	....	
8,500	34,000	.000983	.000033	....	....	
8,750	35,000	.001000	.000017	.000017	—.000033	
9,000	36,000	.001017	.000017	....	....	
9,250	37,000	.001067	.000050	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001117	.000017	....	....	
10,000	40,000	.001150	.000033	0.	—.000017	
10,250	41,000	.001167	.000017	....	....	
10,500	42,000	.001217	.000050	....	....	
10,750	43,000	.001250	.000033	....	....	
11,000	44,000	.001267	.000017	....	....	
11,250	45,000	.001300	.000033	0.	0.	
11,500	46,000	.001317	.000017	....	....	
11,750	47,000	.001367	.000050	....	....	
12,000	48,000	.001400	.000033	....	....	
12,250	49,000	.001433	.000033	....	....	
12,500	50,000	.001467	.000034	—.000033	—.000033	
12,750	51,000	.001483	.000016	....	....	
13,000	52,000	.001500	.000017	....	....	
13,250	53,000	.001550	.000050	....	....	
13,500	54,000	.001583	.000033	....	....	
13,750	55,000	.001617	.000034	—.000050	—.000017	
14,000	56,000	.001633	.000016	....	....	
14,250	57,000	.001650	.000017	....	....	
14,500	58,000	.001683	.000033	....	....	
14,750	50,000	.001717	.000034	....	....	
15,000	60,000	.001750	.000033	—.000050	0.	
15,250	61,000	.001750	0.	....	....	
15,500	62,000	.001783	.000033	....	....	Elastic limit.
15,750	63,000	.001850	.000067	....	....	
16,000	64,000	.001933	.000083	....	....	
16,250	65,000	.002150	.000217	.000183	.000233	
16,500	66,000	.002400	.000250	....	....	
16,750	67,000	.002750	.000350	....	....	
17,000	68,000	.003417	.000667	....	....	
17,250	69,000	.003900	.000483	....	....	
17,500	70,000	.005100	.001200	.002783	.002600	
18,000	72,000	.006550	.001450	....	....	
18,500	74,000	.008567	.002017	....	....	
19,000	76,000	.010417	.001850	....	....	
19,500	78,000	.012483	.002066	....	....	
20,000	80,000	.014333	.001850	....	....	
20,500	82,000	.016150	.001817	....	....	
21,000	84,000	.018517	.002367	....	....	
21,500	86,000	.020333	.001816	....	....	
22,000	88,000	.023333	.003000	....	....	
22,500	90,000	.025500	.002167	....	....	
23,000	92,000	.028400	.002900	....	....	
23,500	94,000	.031417	.003017	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24, 000	96, 000	0. 035167	0. 003750	....	....	
24, 500	98, 000	.037250	.002083	....	....	
25, 000	100, 000	.044583	.007333	....	....	Micrometer removed.
25, 500	102, 000	.0500	.005417	....	....	
26, 000	104, 000	.0583	.0083	....	....	
26, 500	106, 000	.0700	.0117	....	....	
26, 820	107, 280	.0967	.0267	....	....	Ultimate strength.
23, 150	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8609
Hardness		23. 84
Tensile strength per square inch of original section	pounds	107, 280
Elastic limit per square inch of original section	do	62, 000
Elongation per inch after rupture	inch	0. 1317
Elongation per inch under strain at elastic limit	do	.001783
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41. 9
Position of rupture		".75 from middle of stem
Character of broken surface		fine, granular, 60 per centum; dull smoky center, 40 per centum
Elongation of inch sections		".09, ".15 (".31 fractured section), ".10, ".08, ".06

No. 321.

Tension Test.

Marks on bar, $\underset{2}{\text{R A X}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000300	.000183	0.		
3,750	15,000	.000450	.000150	.000017	.000017	
5,000	20,000	.000600	.000150	.000017	0.	
6,250	25,000	.000750	.000150	.000033	.000016	
7,500	30,000	.000900	.000150	.000033	0.	
8,750	35,000	.001050	.000150	.000033	0.	
10,000	40,000	.001217	.000167	.000033	0.	
10,250	41,000	.001250	.000033			
10,500	42,000	.001300	.000050			
10,750	43,000	.001333	.000033			
11,000	44,000	.001350	.000017			
11,250	45,000	.001367	.000017	.000050	.000017	
11,500	46,000	.001383	.000016			
11,750	47,000	.001417	.000034			
12,000	48,000	.001467	.000050			
12,250	49,000	.001500	.000033			
12,500	50,000	.001550	.000050	.000050	0.	
12,750	51,000	.001567	.000017			
13,000	52,000	.001600	.000033			
13,250	53,000	.001667	.000067			
13,500	54,000	.001700	.000033			
13,750	55,000	.001733	.000033	.000067	.000017	
14,000	56,000	.001767	.000034			
14,250	57,000	.001800	.000033			
14,500	58,000	.001850	.000050			
14,750	59,000	.001867	.000017			
15,000	60,000	.001933	.000066	.000083	.000016	
15,250	61,000	.001983	.000050			
15,500	62,000	.002017	.000034			Elastic limit.
15,750	63,000	.002117	.000100			
16,000	64,000	.002433	.000316			
16,250	65,000	.002850	.000417	.000733	.000650	
16,500	66,000	.003467	.000617			
16,750	67,000	.004233	.000766			
17,000	68,000	.005150	.000917			
17,250	69,000	.005933	.000783			
17,500	70,000	.006967	.001034	.004550	.003817	
18,000	72,000	.008667	.001700			
18,500	74,000	.010617	.001950			
19,000	76,000	.012350	.001733			
19,500	78,000	.014067	.001717			
20,000	80,000	.016283	.002216			
20,500	82,000	.018017	.001734			
21,000	84,000	.019533	.001516			
21,500	86,000	.022567	.003034			
22,000	88,000	.024533	.001966			
22,500	90,000	.027250	.002717			
23,000	92,000	.030800	.003550			
23,500	94,000	.033783	.002983			
24,000	96,000	.037367	.003584			
24,500	98,000	.042000	.004633			
25,000	100,000	.046667	.004667			Micrometer removed.
25,500	102,000	.0533	.006633			
26,000	104,000	.0633	.0100			
26,500	106,000	.0850	.0217			
26,800	107,200	.1167	.0317			Ultimate strength.
22,480						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107,200
Elastic limit per square inch of original section	do....	62,000
Elongation per inch after rupture	inch..	0.1667
Elongation per inch under strain at elastic limit	do....	.002017
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.80 from middle of stem
Character of broken surface		fine granular, 50 per centum; dull, smoky center, 50 per centum
Elongation of inch sections		″.10, ″.16 (″.35 fractured section), ″.14, ″.13, ″.12

No. 324.

Tension Test.

Marks on bar, $\text{R}\underset{3}{\text{A}}\text{X}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000367	.000100	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.000967	.000134	0.	....	
10,000	40,000	.001067	.000100	0.	....	
10,250	41,000	.001133	.000066	....	....	
10,500	42,000	.001200	.000067	....	....	
10,750	43,000	.001267	.000067	....	....	
11,000	44,000	.001333	.000066	....	....	
11,250	45,000	.001333	0.	.000033	.000033	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001367	0.	....	....	
12,000	48,000	.001433	.000066	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001500	.000033	.000033	0.	
12,750	51,000	.001533	.000033	....	....	
13,000	52,000	.001567	.000034	....	....	
13,250	53,000	.001600	.000033	....	....	
13,500	54,000	.001633	.000033	....	....	
13,750	55,000	.001667	.000034	.000033	0.	
14,000	56,000	.001700	.000033	....	....	
14,250	57,000	.001733	.000033	....	....	
14,500	58,000	.001767	.000034	....	....	
14,750	59,000	.001800	.000033	....	....	
15,000	60,000	.001833	.000033	.000033	0.	
15,250	61,000	.001867	.000034	....	....	
15,500	62,000	.001900	.000033	....	....	
15,750	63,000	.001967	.000067	....	....	
16,000	64,000	.002000	.000033	....	....	
16,250	65,000	.002067	.000067	.000167	.000134	Elastic limit.
16,500	66,000	.002833	.000766	....	....	
16,750	67,000	.003200	.000367	....	....	
17,000	68,000	.004033	.000833	....	....	
17,250	69,000	.004900	.000867	....	....	
17,500	70,000	.006300	.001400	.003867	.003700	
18,000	72,000	.007967	.001667	....	....	
18,500	74,000	.010000	.002033	....	....	
19,000	76,000	.012000	.002000	....	....	
19,500	78,000	.013833	.001833	....	....	
20,000	80,000	.015833	.002000	....	....	
20,500	82,000	.018200	.002367	....	....	
21,000	84,000	.020800	.002600	....	....	
21,500	86,000	.022800	.002000	....	....	
22,000	88,000	.026000	.003200	....	....	
22,500	90,000	.028667	.002667	....	....	
23,000	92,000	.031733	.003066	....	....	
23,500	94,000	.035033	.003300	....	....	
24,000	96,000	.039933	.004900	....	....	
24,500	98,000	.043833	.003900	....	....	
25,000	100,000	.051067	.007234	....	....	Micrometer removed.
25,500	102,000	.0600	.008933	....	....	
26,000	104,000	.0767	.0167	....	....	
26,300	105,200	.1067	.0300	....	....	Ultimate strength.
20,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	105,200
Elastic limit per square inch of original section	do	65,000
Elongation per inch after rupture	inch	0.1933
Elongation per inch under strain at elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		".90 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		".09, ".18 (".36 fractured section)

No. 325.

Tension Test.

Marks on bar, $\mathrm{R}\,\underset{4}{\mathrm{A}}\,\mathrm{X}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000333	.000100	0.	....	
5,000	20,000	.000433	.000100	0.	....	
6,250	25,000	.000600	.000167	0.	....	
7,500	30,000	.000767	.000167	0.	....	
8,750	35,000	.000900	.000133	0.	....	
10,000	40,000	.001033	.000133	0.	....	
10,250	41,000	.001067	.000034	....	....	
10,500	42,000	.001100	.000033	....	....	
10,750	43,000	.001133	.000033	....	....	
11,000	44,000	.001167	.000034	....	....	
11,250	45,000	.001200	.000033	0.	....	
11,500	46,000	.001233	.000033	....	....	
11,750	47,000	.001267	.000034	....	....	
12,000	48,000	.001333	.000066	....	....	
12,250	49,000	.001367	.000034	....	....	
12,500	50,000	.001367	0.	0.	....	
12,750	51,000	.001400	.000033	....	....	
13,000	52,000	.001433	.000033	....	....	
13,250	53,000	.001433	0.	....	....	
13,500	54,000	.001467	.000034	....	....	
13,750	55,000	.001500	.000033	0.	....	
14,000	56,000	.001533	.000033	....	....	
14,250	57,000	.001567	.000034	....	....	
14,500	58,000	.001633	.000066	....	....	
14,750	59,000	.001667	.000034	....	....	
15,000	60,000	.001700	.000033	0.	....	
15,250	61,000	.001700	0.	....	....	
15,500	62,000	.001733	.000033	....	....	
15,750	63,000	.001767	.000034	....	....	
16,000	64,000	.001833	.000066	....	....	
16,250	65,000	.001933	.000100	0.	....	
16,500	66,000	.001967	.000034	....	....	Elastic limit.
16,750	67,000	.002100	000133	....	....	
17,000	68,000	.002633	.000533	....	....	
17,250	69,000	.003033	.000400	....	....	
17,500	70,000	.004167	.001134	.001733	.001733	
18,000	72,000	.006000	.001833	....	....	
18,500	74,000	.007500	.001500	....	....	
19,000	76,000	.009067	.001567	....	....	
19,500	78,000	.011433	.002366	....	....	
20,000	80,000	.013033	.001600	....	....	
20,500	82,000	.015300	.002267	....	....	
21,000	84,000	.016900	.001600	....	....	
21,500	86,000	.019100	.002200	....	....	
22,000	88,000	.021500	.002400	....	....	
22,500	90,000	.023767	.002267	....	....	
23,000	92,000	.026500	.002733	....	....	
23,500	94,000	.029333	.002833	....	....	
24,000	96,000	.032167	.002834	....	....	
24,500	98,000	.035667	.003500	....	....	
25,000	100,000	.041000	.005333	....	....	Micrometer removed.
25,500	102,000	.0467	.0057	....	....	
26,000	104,000	.0533	.0066	....	....	
26,500	106,000	.0633	.0100	....	....	
27,000	108,000	.0767	.0134	....	....	
27,310	109,240	.1167	.0400	....	....	Ultimate strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	109,240
Elastic limit per square inch of original section	do....	66,000
Elongation per inch after rupture	inch..	0.1767
Elongation per inch under strain at elastic limit	do....	.001967
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.10 from neck
Character of broken surface .... fine granular, 60 per centum.; dull center, 40 per centum		
Elongation of inch sections		″.09, ″.17 (″.27 fractured section)

No. 382.

Tension Test.

Marks on bar, $\overset{\text{B A X}}{5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	.000017	.000017	
3,750	15,000	.000467	.000167	.000033	.000016	
5,000	20,000	.000617	.000150	.000050	.000017	
6,250	25,000	.000783	.000166	.000050	0.	
7,500	30,000	.000950	.000167	.000050	0.	
8,750	35,000	.001133	.000183	.000050	0.	
10,000	40,000	.001300	.000167	.000050	0.	
10,250	41,000	.001300	0.	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001417	.000050	....	....	
11,250	45,000	.001467	.000050	.000050	0.	
11,500	46,000	.001483	.000016	....	....	
11,750	47,000	.001517	.000034	....	....	
12,000	48,000	.001567	.000050	....	....	
12,250	49,000	.001583	.000016	....	....	
12,500	50,000	.001633	.000050	.000067	.000017	
12,750	51,000	.001650	.000017	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001750	.000033	....	....	
13,750	55,000	.001800	.000050	.000083	.000016	
14,000	56,000	.001817	.000017	....	....	
14,250	57,000	.001867	.000050	....	....	
14,500	58,000	.001917	.000050	....	....	
14,750	59,000	.001950	.000033	....	....	
15,000	60,000	.001983	.000033	.000083	0.	
15,250	61,000	.002017	.000034	....	....	
15,500	62,000	.002050	.000033	....	....	Elastic limit.
15,750	63,000	.002117	.000067	....	....	
16,000	64,000	.002200	.000083	....	....	
16,250	65,000	.002483	.000283	.000417	.000334	
16,500	66,000	.003517	.001034	....	....	
16,750	67,000	.004450	.000933	....	....	
17,000	68,000	.005750	.001300	....	....	
17,250	69,000	.006383	.000633	....	....	
17,500	70,000	.007450	.001067	.005000	.004583	
18,000	72,000	.008950	.001500	....	....	
18,500	74,000	.010600	.001650	....	....	
19,000	76,000	.012767	.002167	....	....	
19,500	78,000	.014617	.001850	....	....	
20,000	80,000	.016667	.002050	....	....	
20,500	82,000	.019150	.002483	....	....	
21,000	84,000	.021033	.001883	....	....	
21,500	86,000	.023917	.002884	....	....	
22,000	88,000	.026167	.002250	....	....	
22,500	90,000	.028833	.002666	....	....	
23,000	92,000	.032000	.003167	....	....	
23,500	94,000	.035867	.003867	....	....	Micrometer removed.
24,000	96,000	.0400	.004133	....	....	
24,500	98,000	.0467	.0067	....	....	
25,000	100,000	.0517	.0050	....	....	
25,500	102,000	.0600	.0083	....	....	
26,000	104,000	.0800	.0200	....	....	
26,290	105,160	.1150	.0350	....	....	Ultimate strength.
20,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	105,160
Elastic limit per square inch of original section	do....	62,000
Elongation per inch after rupture	inch..	0.1583
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		1″.85 from neck
Character of broken surface		fine silky, interspersed with traces of granular metal; cup-shaped ends
Elongation of inch sections		″.09, ″.10, ″.10, ″.13 (″.38 fractured section) ″.12

No. 383.

Marks on bar, $^{\text{R A X}}_{\quad 6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	.000017	.000017	
5,000	20,000	.000633	.000166	.000033	.000016	
6,250	25,000	.000783	.000150	.000033	0.	
7,500	30,000	.000950	.000167	.000050	.000017	
8,750	35,000	.001117	.000167	.000050	0.	
10,000	40,000	.001283	.000166	.000050	0.	
10,250	41,000	.001317	.000034	....	....	
10,500	42,000	.001350	.000033	....	....	
10,750	43,000	.001350	0.	....	....	
11,000	44,000	.001400	.000050	....	....	
11,250	45,000	.001433	.000033	.000050	0.	
11,500	46,000	.001483	.000050	....	....	
11,750	47,000	.001500	.000017	....	....	
12,000	48,000	.001533	.000033	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001617	.000050	.000067	.000017	
12,750	51,000	.001667	.000050	....	....	
13,000	52,000	.001683	.000016	....	....	
13,250	53,000	.001700	.000017	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	.000067	0.	
14,000	56,000	.001850	.000083	....	....	
14,250	57,000	.001867	.000017	....	....	
14,500	58,000	.001917	.000050	....	....	
14,750	59,000	.001950	.000033	....	....	Elastic limit.
15,000	60,000	.002017	.000067	.0000150	.000083	
15,250	61,000	.002267	.000250	....	....	
15,500	62,000	.002767	.000500	....	....	
15,750	63,000	.003333	.000566	....	....	
16,000	64,000	.004300	.000967	....	....	
16,250	65,000	.004717	.000417	.002450	.002300	
16,500	66,000	.005800	.001083	....	....	
16,750	67,000	.006133	.000333	....	....	
17,000	68,000	.006867	.000734	....	....	
17,250	69,000	.007750	.000883	....	....	
17,500	70,000	.008600	.001050	.006183	.003733	
18,000	72,000	.010467	.001667	....	....	
18,500	74,000	.011850	.001383	....	....	
19,000	76,000	.013733	.001883	....	....	
19,500	78,000	.015833	.002100	....	....	
20,000	80,000	.017517	.001684	....	....	
20,500	82,000	.019583	.002066	....	....	
21,000	84,000	.021667	.002084	....	....	
21,500	86,000	.024050	.002383	....	....	
22,000	88,000	.026500	.002450	....	....	
22,500	90,000	.029700	.003200	....	....	
23,000	92,000	.032917	.003217	....	....	
23,500	94,000	.036500	.003583	....	....	Micrometer removed.
24,000	96,000	.0417	.0052	....	....	
24. 500	98,000	.0450	.0033	....	....	
25. 000	100,000	.0533	.0083	....	....	
25,500	102,000	.0617	.0084	....	....	
26,000	104,000	.0750	.0133	....	....	
26,340	105,360	.1117	.0367	....	....	Ultimate strength.
22,900	....	....	....	....	....	Load at time of fracture.

General summary.

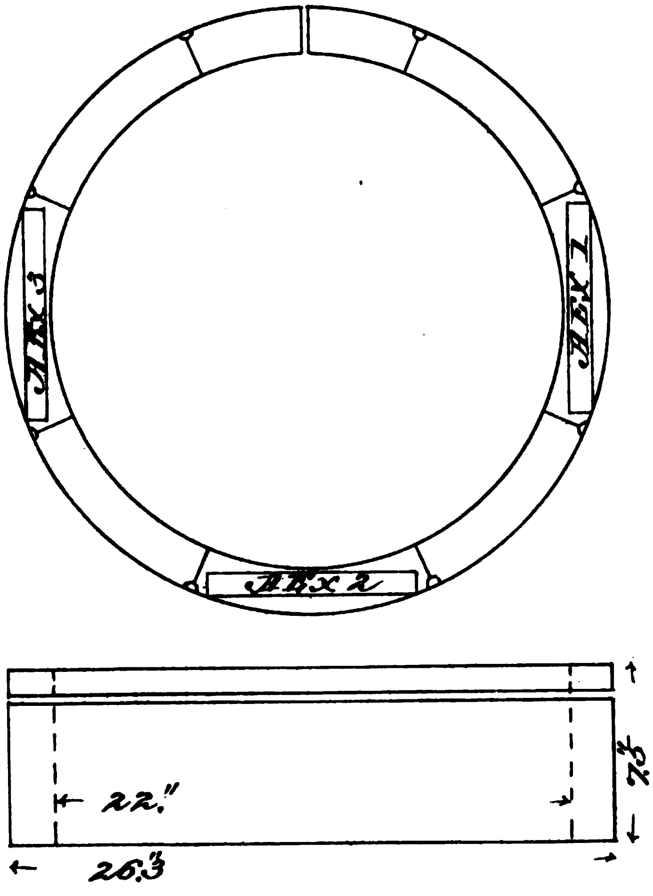
Tensile strength per square inch of original section	pounds..	105,360
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1450
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1″.80 from neck
Character of broken surface		silky center; silky, interspersed with granular metal at circumference.
Elongation of inch sections		″.08, ″.10, ″.11, ″.13 (″.35 fractured section) ″.10

8" Steel B.L. Rifle.

Hoop Ax

Experimental section.

Location of specimens taken out after unhooping.



S Ex 36 49 1

No. 705.

Marks, A E X1
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000017	.000017	
2,500	10,000	.000333	.000166	.000033	.000016	
3,750	15,000	.000500	.000167	.000033	0.	
5,000	20,000	.000667	.000167	.000067	.000034	
6,250	25,000	.000817	.000150	.000067	0.	
7,500	30,000	.001000	.000183	.000067	0.	
8,750	35,000	.001133	.000133	.000067	0.	
10,000	40,000	.001300	.000167	.000067	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000033	....	....	
11,250	45,000	.001467	.000034	.000067	0.	
11,500	46,000	.001483	.000016	....	....	
11,750	47,000	.001533	.000050	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001650	.000050	.000067	0.	
12,750	51,000	.001667	.000017	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001717	.000017	....	....	
13,500	54,000	.001767	.000050	....	....	
13,750	55,000	.001817	.000050	.000067	0.	
14,000	56,000	.001867	.000050	....	....	
14,250	57,000	.001883	.000016	....	....	Elastic limit.
14,500	58,000	.002017	.000134	....	....	
14,750	59,000	.003883	.001866	....	....	
15,000	60,000	.005133	.001250	.002900	.002833	
15,250	61,000	.005667	.000534	....	....	
15,500	62,000	.006417	.000750	....	....	
15,750	63,000	.007167	.000750	....	....	
16,000	64,000	.008100	.000933	....	....	
16,250	65,000	.008817	.000717	....	....	
16,500	66,000	.009733	.000916	....	....	
16,750	67,000	.010517	.000784	....	....	
17,000	68,000	.011583	.001066	....	....	
17,250	69,000	.012183	.000600	....	....	
17,500	70,000	.013050	.000867	....	....	
18,000	72,000	.014833	.001783	....	....	
18,500	74,000	.017167	.002334	....	....	
19,000	76,000	.019033	.001866	....	....	
19,500	78,000	.021350	.002317	....	....	
20,000	80,000	.023417	.002067	....	....	
20,500	82,000	.025750	.002333	....	....	
21,000	84,000	.028700	.002950	....	....	
21,500	86,000	.031667	.002967	....	....	
22,000	88,000	.033167	.001500	....	....	
22,500	90,000	.039167	.006000	....	....	
23,000	92,000	.043500	.004333	....	....	
23,500	94,000	.049000	.005500	....	....	
24,000	96,000	.0567	.0077	....	....	
24,500	98,000	.0667	.0100	....	....	
25,000	100,000	.0833	.0166	....	....	
25,110	100,440	.1167	.0834	....	....	Tensile strength.
20,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity ?		7.8576
Hardness		20.14
Tensile strength per square inch of original section	pounds..	100,440
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1667
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1″ from middle of stem
Character of broken surface		silky; traces of fine granulation
Elongation of inch sections		″.11, ″.21, ″.35*, ″.13, ″.11, ″.09

No. 706.

Marks, A E X2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	000250	.000150	0.	....	
3,750	15,000	.000400	.000150	0.	....	
5,000	20,000	.000550	.000150	0.	....	
6,250	25,000	.000733	.000183	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000163	0.	....	
10,250	41,000	.001250	.000017	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001550	.000050	....	....	
12,500	50,000	.001583	.000033	0.	....	
12,750	51,000	.001600	.000017	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001717	.000050	....	....	
13,750	55,000	.001733	.000016	.000017	.000017	
14,000	56,000	.001817	.000084	....	....	
14,250	57,000	.001833	.000016	....	....	
14,500	58,000	.001867	.000034	....	....	
14,750	59,000	.001883	.000016	....	....	Elastic limit.
15,000	60,000	.001983	.000100	.000067	.000050	
15,250	61,000	.003800	.001817	....	....	
15,500	62,000	.006450	.002650	....	....	
15,750	63,000	.006833	.000383	....	....	
16,000	64,000	.007300	.000467	....	....	
16,250	65,000	.007983	.000633	....	....	
16,500	66,000	.009000	.001067	....	....	
16,750	67,000	.009967	.000967	....	....	
17,000	68,000	.010833	.000866	....	....	
17,250	69,000	.011667	.000834	....	....	
17,500	70,000	.012750	.001083	....	....	
18,000	72,000	.014167	.001417	....	....	
18,500	74,000	.016500	.002333	....	....	
19,000	76,000	.018667	.002167	....	....	
19,500	78,000	.021017	.003350	....	....	
20,000	80,000	.023167	.002150	....	....	
20,500	82,000	.025750	.002583	....	....	
21,000	84,000	.028500	.002750	....	....	
21,500	86,000	.031500	.003000	....	....	
22,000	88,000	.034583	.003083	....	....	
22,500	90,000	.038833	.004250	....	....	
23,000	92,000	.044750	.005917	....	....	
23,500	94,000	.049500	.004750	....	....	
24,000	96,000	.0617	.0122	....	....	
24,500	98,000	.0700	.0083	....	....	
24,920	99,680	.0967	.0267	....	....	Tensile strength.
19,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	99,680
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		2″.1 from neck
Character of broken surface		fine silky, cup-shaped end
Elongation of inch sections		″.12, ″.39*, ″.18, ″.12, ″.10, ″.07

No. 707.

Marks, A E X3.
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	.000017	.000017	
3,750	15,000	.000500	.000167	000050	.000033	
5,000	20,000	.000667	.000167	.000050	0.	
6,250	25,000	.000833	.000166	.000067	.000017	
7,500	30,000	.001000	.000167	.000067	0.	
8,750	35,000	.001167	.000167	.000067	0.	
10,000	40,000	.001333	.000166	.000067	0.	
10,250	41,000	.001350	.000017	....	....	
10,500	42,000	.001367	.000017	....	....	
10,750	43,000	.001383	.000016	....	....	
11,000	44,000	.001450	.000067	....	....	
11,250	45,000	.001483	.000033	.000067	0.	
11,500	46,000	.001533	.000050	....	....	
11,750	47,000	.001550	.000017	....	....	
12,000	48,000	.001567	.000017	....	....	
12,250	49,000	.001617	.000050	....	....	
12,500	50,000	.001650	.000033	.000067	.0	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001717	.000034	....	....	
13,250	53,000	.001733	.000016	....	....	
13,500	54,000	.001783	.000050	....	....	
13,750	55,000	.001800	.000017	.000083	.000016	
14,000	56,000	.001850	.000050	....	....	
14,250	57,000	.001883	.000033	....	....	
14,500	58,000	.001933	.000050	....	....	
14,750	59,000	.001967	.000034	....	....	
15,000	60,000	.002033	.000066	.000100	.000017	
15,250	61,000	.002050	.000017	....	....	Elastic limit.
15,500	62,000	.002367	.000317	....	....	
15,750	63,000	.003500	.001133	....	....	
16,000	64,000	005017	.001517	....	....	
16,250	65,000	.006083	.001066	....	....	
16,500	66,000	.007333	.001250	....	....	
16,750	67,000	.008167	.000834	....	....	
17,000	68,000	.009133	.000966	....	....	
17,250	69,000	.009750	.000617	....	....	
17,500	70,000	.010583	.000833	....	....	
18,000	72,000	.012333	.001750	....	....	
18,500	74,000	.014133	.001800	....	....	
19,000	76,000	.016167	.002034	....	....	
19,500	78,000	.018033	.001866	....	....	
20,000	80,000	.020000	.001967	....	....	
20,500	82,000	.022750	.002750	....	....	
21,000	84,000	.024733	.001983	....	....	
21,500	86,000	.027583	.002850	....	....	
22,000	88,000	.030833	.002750	....	....	
22,500	90,000	.033333	.003000	....	....	
23,000	92,000	.037167	.003834	....	....	
23,500	94,000	.040833	.003666	....	....	
24,000	96,000	.046417	.005584	....	....	
24,500	98,000	.054000	.007583	....	....	
25,000	100,000	.0617	.0077	....	....	
25,500	102,000	.0833	.0216	....	....	
25,790	103,160	.1100	.0267	....	....	Tensile strength.
20,400	....	....	....	....	....	Load at time of rupture.

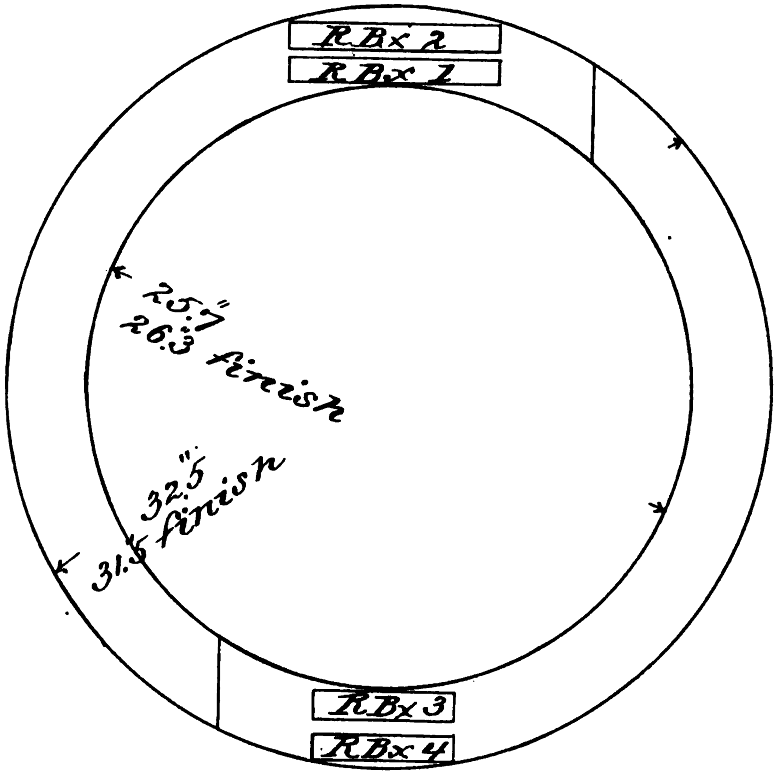
General summary.

Tensile strength per square inch of original section	pounds..	103,160
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		54.6
Position of rupture		".7 from middle of stem
Character of broken surface		fine silky, cup-shaped end
Elongation of inch sections		".10, ".17, ".19, ".39*, ".14, ".09

8" Steel B.L. Rifle.

Hoop Bx

Experimental section.



No. 322.

Tension Test.

Marks on bar, $^{\mathrm{RBX}}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000283	.000116	0.	....	
3,750	15,000	.000417	.000134	0.	....	
5,000	20,000	.000567	.000150	0.	....	
6,250	25,000	.000700	.000133	.000017	.000017	
7,500	30,000	.000850	.000150	.000033	.000016	
8,750	35,000	.001017	.000167	.000033	0.	
10,000	40,000	.001167	.000150	.000033	0.	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001283	.000050	....	....	
11,000	44,000	.001317	.000034	....	....	
11,250	45,000	.001333	.000016	.000033	0.	
11,500	46,000	.001350	.000017	....	....	
11,750	47,000	.001400	.000050	....	....	
12,000	48,000	.001450	.000050	....	....	
12,250	49,000	.001483	.000033	....	....	
12,500	50,000	.001517	.000034	.000050	.000017	
12,750	51,000	.001533	.000016	....	....	
13,000	52,000	.001583	.000050	....	....	
13,250	53,000	.001650	.000067	....	....	
13,500	54,000	.001683	.000033	....	....	
13,750	55,000	.001717	.000034	.000067	.000017	
14,000	56,000	.001750	.000033	....	....	
14,250	57,000	.001783	.000033	....	....	
14,500	58,000	.001833	.000050	....	....	Elastic limit.
14,750	59,000	.001917	.000084	....	....	
15,000	60,000	.002100	.000183	.000267	.000200	
15,250	61,000	.002400	.000300	....	....	
15,500	62,000	.002850	.000450	....	....	
15,750	63,000	.003467	.000617	....	....	
16,000	64,000	.004250	.000783	....	....	
16,250	65,000	.005267	.001017	.003033	.002766	
16,500	66,000	.005933	.000666	....	....	
16,750	67,000	.006800	.000867	....	....	
17,000	68,000	.008000	.001200	....	....	
17,250	69,000	.008500	.000500	....	....	
17,500	70,000	.009850	.001350	.007317	.004284	
18,000	72,000	.011100	.001250	....	....	
18,500	74,000	.013183	.002083	....	....	
19,000	76,000	.015200	.002017	....	....	
19,500	78,000	.017383	.002183	....	....	
20,000	80,000	.019500	.002117	....	....	
20,500	82,000	.021667	.002167	....	....	
21,000	84,000	.024417	.002750	....	....	
21,500	86,000	.027183	.002766	....	....	
22,000	88,000	.029650	.002467	....	....	
22,500	90,000	.033283	.003633	....	....	
23,000	92,000	.037417	.004134	....	....	
23,500	94,000	.041083	.003666	....	....	
24,000	96,000	.046333	.005250	....	....	
24,500	98,000	.051533	.005500	....	....	
25,000	100,000	.061667	.009834	....	....	Micrometer removed.
25,500	102,000	.0783	.016633	....	....	
25,730	102,920	.0983	.0200	....	....	
25,800	103,280	.1150	.0167	....	....	Ultimate strength.
23,210	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8583
Hardness		22.26
Tensile strength per square inch of original section	pounds..	103,280
Elastic limit per square inch of original section	do....	58,000
Elongation per inch after rupture	inch..	0.1600
Elongation per inch under strain at elastic limit	do....	.001833
Elongation per inch at point of rupture	do....	.124
Reduction in diameter after rupture, per centum of original section		39.2
Reduction in area		″.90 from neck
Position of rupture		fine granular 80 per cent., dull smoky center 20 per cent
Character of broken surface		″.12, ″.11, ″.13, ″.18, ″.17 (″.30 fractured section)
Elongation of inch sections		

No. 323.

Tension Test.

Marks on bar, $^{\text{R B X}}_{\ \ 2}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000383	.000150	0.	....	
5,000	20,000	.000517	.000134	0.	....	
6,250	25,000	.000667	.000150	0.	....	
7,500	30,000	.000833	.000166	.000017	.000017	
8,750	35,000	.001000	.000167	.000017	0.	
10,000	40,000	.001150	.000150	.000017	0.	
10,250	41,000	.001183	.000033	....	....	
10,500	42,000	.001233	.000050	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	.000033	.000016	
11,500	46,000	.001350	.000017	....	....	
11,750	47,000	.001383	.000033	....	....	
12,000	48,000	.001433	.000050	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001517	.000050	.000050	.000017	
12,750	51,000	.001533	.000016	....	....	
13,000	52,000	.001583	.000050	....	....	
13,250	53,000	.001633	.000050	....	....	
13,500	54,000	.001667	.000034	....	....	
13,750	55,000	.001700	.000033	.000100	.000050	Elastic limit.
14,000	56,000	.001767	.000067	....	....	
14,250	57,000	.001833	.000066	....	....	
14,500	58,000	.002050	.000217	....	....	
14,750	59,000	.002333	.000283	....	....	
15,000	60,000	.002867	.000534	.001000	.000900	
15,250	61,000	.003633	.000766	....	....	
15,500	62,000	.004483	.000850	....	....	
15,750	63,000	.005100	.000617	....	....	
16,000	64,000	.006250	.001150	....	....	
16,250	65,000	.007033	.000783	.004783	.003783	
16,500	66,000	.007833	.000800	....	....	
16,750	67,000	.008583	.000750	....	....	
17,000	68,000	.009317	.000734	....	....	
17,250	69,000	.010333	.001016	....	....	
17,500	70,000	.011483	.001150	.008883	.004100	
18,000	72,000	.013167	.001684	....	....	
18,500	74,000	.015083	.001916	....	....	
19,000	76,000	.017100	.002017	....	....	
19,500	78,000	.019400	.002300	....	....	
20,000	80,000	.021400	.002000	....	....	
20,500	82,000	.024633	.002933	....	....	
21,000	84,000	.027000	.002667	....	....	
21,500	86,000	.029583	.002583	....	....	
22,000	88,000	.031833	.002250	....	....	
22,500	90,000	.036917	.005084	....	....	
23,000	92,000	.041250	.004333	....	....	
23,500	94,000	.046683	.005433	....	....	
24,000	96,000	.053200	.006517	....	....	
24,500	98,000	.062000	.008800	....	....	Micrometer removed.
25,000	100,000	.0767	.0147	....	....	
25,460	101,840	.1117	.0350	....	....	Ultimate strength.
22,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	101,840
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1567
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.75 from neck
Character of broken surface		fine granular 60 per cent., dull smoky center 40 per cent.
Elongation of inch sections		″.09, ″.11, ″.12, ″.14, ″.17 (″.31 fractured section)

No. 326.

Tension Test.

Marks on bar, $^{\text{R B X}}_{\;\;\;3}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.		
2,500	10,000	.000267	.000200	0.		
3,750	15,000	.000367	.000100	0.		
5,000	20,000	.000567	.000200	0.		
6,250	25,000	.000700	.000133	0.		
7,500	30,000	.000833	.000133	0.		
8,750	35,000	.001000	.000167	0.		
10,000	40,000	.001167	.000167	0.		
10,250	41,000	.001200	.000033			
10,500	42,000	.001300	.000100			
10,750	43,000	.001300	0.			
11,000	44,000	.001333	.000033			
11,250	45,000	.001333	0.	0.		
11,500	46,000	.001333	0.			
11,750	47,000	.001400	.000067			
12,000	48,000	.001433	.000033			
12,250	49,000	001467	.000034			
12,500	50,000	.001533	.000066	.000033	.000033	
12,750	51,000	.001600	.000067			
13,000	52,000	.001633	.000033			
13,250	53,000	.001667	.000034			
13,500	54,000	.001667	0.			
13,750	55,000	.001700	.000033	.000033	0.	
14,000	56,000	.001733	.000033			
14,250	57,000	.001767	.000034			
14,500	58,000	.001833	.000066			
14,750	59,000	.001867	.000034			
15,000	60,000	.001900	.000033	.000067	.000034	
15,250	61,000	.001933	.000033			Elastic limit.
15,500	62,000	.002033	.000100			
15,750	63,000	.002267	.000234			
16,000	64,000	.002667	.000400			
16,250	65,000	.003133	.000466	.001000	.000933	
16,500	66,000	.004233	.001100			
16,750	67,000	.005000	.000767			
17,000	68,000	.006067	.001067			
17,250	69,000	.006833	.000766			
17,500	70,000	.008300	.001467	.005767	.004767	
18,000	72,000	.009367	.001067			
18,500	74,000	.011367	.002000			
19,000	76,000	.013433	.002066			
19,500	78,000	.015667	.002234			
20,000	80,000	.017933	.002266			
20,500	82,000	.019667	.001734			
21,000	84,000	.022167	.002500			
21,500	86,000	.024800	.002633			
22,000	88,000	.026933	.002133			
22,500	90,000	.031033	.004100			
23,000	92,000	.033400	.002367			
23,500	94,000	.037333	.003933			
24,000	96,000	.042233	.004900			
24,500	98,000	.047867	.005634			
25,000	100,000	.055333	.007466			Micrometer removed.
25,500	102,000	.0667	.011367			
26,000	104,000	.0933	.0266			
26,020	104,080	.1000	.0067			
26,090	104,360	.1200	.0200			Ultimate strength.
23,000						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,360
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1867
Elongation per inch under strain of elastic limit	do....	.001933
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		".50 from middle of stem
Character of broken surface		fine granular, small dull spot at center
Elongation of inch sections		".18 (".26 fractured section), ".12

No. 327.

Tension Test.

Marks on bar, $^{\text{R B X}}_{4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.000967	.000134	0.	....	
10,000	40,000	.001200	.000233	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001333	0.	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	
12,000	48,000	.001467	.000067	....	....	
12,250	49,000	.001500	.000033	....	....	
12,500	50,000	.001533	.000033	0.	....	
12,750	51,000	.001533	0.	....	....	
13,000	52,000	.001567	.000034	....	....	
13,250	53,000	.001600	.000033	....	....	
13,500	54,000	.001633	.000033	....	....	
13,750	55,000	.001667	.000034	.000033	.000033	
14,000	56,000	.001733	.000066	....	....	
14,250	57,000	.001800	.000067	....	....	
14,500	58,000	.001867	.000067	....	....	
14,750	59,000	.001900	.000033	....	....	
15,000	60,000	.001933	.000033	.000133	.000100	Elastic limit.
15,250	61,000	.002033	.000100	....	....	
15,500	62,000	.002167	.000134	....	....	
15,750	63,000	.002500	.000333	....	....	
16,000	64,000	.003000	.000500	....	....	
16,250	65,000	.003767	.000767	.001567	.001434	
16,500	66,000	.004600	.000833	....	....	
16.750	67,000	.005567	.000967	....	....	
17,000	68,000	.006667	.001100	....	....	
17,250	69,000	.007567	.000900	....	....	
17,500	70,000	.008467	.000900	.005933	.004366	
18,000	72,000	.010100	.001633	....	....	
18,500	74,000	.011967	.001867	....	....	
19,000	76,000	.014300	.002333	....	....	
19,500	78,000	.016067	.001767	....	....	
20,000	80,000	.018300	.002233	....	....	
20,500	82,000	.020600	.002300	....	....	
21,000	84,000	.022733	.002133	....	....	
21,500	86,000	.025900	.003167	....	....	
22,000	88,000	.028300	.002400	....	....	
22,500	90,000	.031733	.003433	....	....	
23,000	92,000	.035233	.003500	....	....	
23,500	94,000	.039200	.003967	....	....	
24,000	96,000	.044567	.005367	....	....	
24,500	98,000	.050000	.005433	....	....	
25,000	100,000	.062833	.012833	....	....	Micrometer removed.
25,500	102,000	.0667	.003867	....	....	
26,000	104,000	.1000	.0333	....	....	Ultimate strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

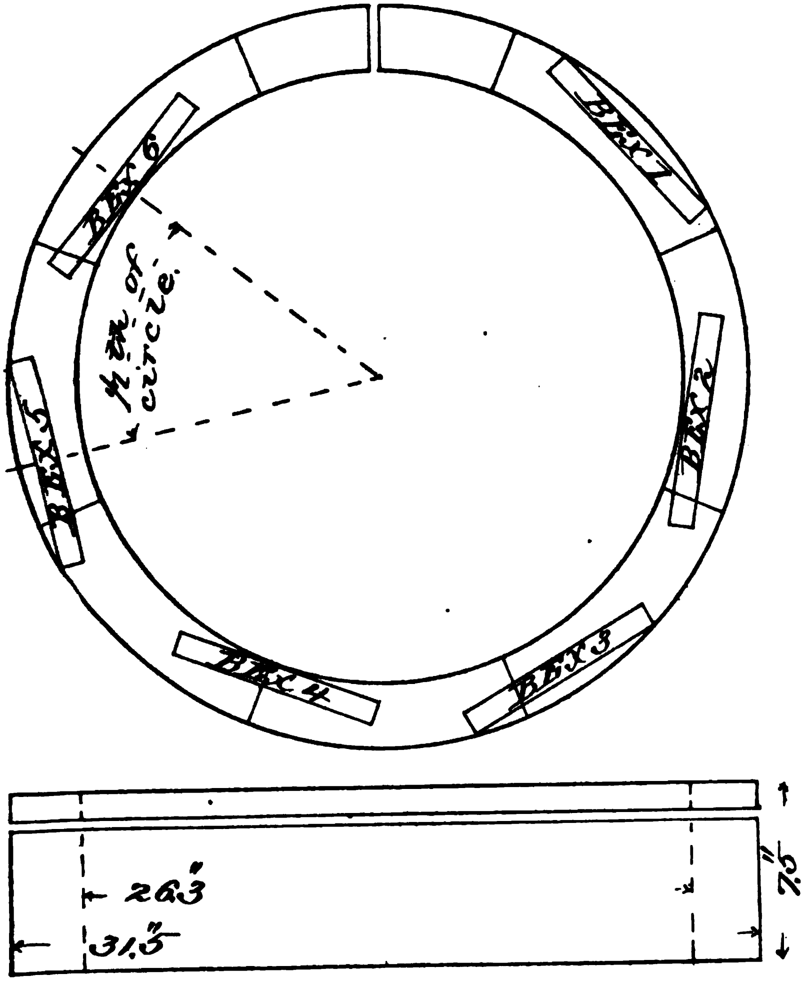
Tensile strength per square inch of original section .... pounds.. 104,000
Elastic limit per square inch of original section .... do ... 60,000
Elongation per inch after rupture .... inch.. 0.1867
Elongation per inch under strain at elastic limit .... do.... .001933
Reduction in diameter at point of rupture .... do.... .124
Reduction in area after rupture, per centum of original section 39.2
Position of rupture .... 1″ from neck
Character of broken surface.....fine granular 80 per cent., dull smoky spot 20 per cent., ″.1 eccentric
Elongation of inch sections .... ″.12, ″.16 (″.28 fractured section)

8" Steel B.L. Rifle.

Hoop Bx

Experimental section.

Location of specimens taken
out after unhooping.



S Ex 36 49 1

No. 700.

Marks, B E X 1
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000400	.000133	0.		
5,000	20,000	.000567	.000167	0.		
6,250	25,000	.000717	.000150	0.		
7,500	30,000	.000900	.000183	0.		
8,750	35,000	.001067	.000167	0.		
10,000	40,000	.001233	.000166	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001350	.000017			
11,250	45,000	.001383	.000033	0.		
11,500	46,000	.001433	.000050			
11,750	47,000	.001467	.000034			
12,000	48,000	.001500	.000033			
12,250	49,000	.001550	.000050			
12,500	50,000	.001583	.000033	0.		
12,750	51,000	.001617	.000034			
13,000	52,000	.001650	.000033			
13,250	53,000	.001700	.000050			
13,500	54,000	.001733	.000033			
13,750	55,000	.001783	.000050	.000050	.000050	Elastic limit.
14,000	56,000	.001867	.000084			
14,250	57,000	.001950	.000083			
14,500	58,000	.002067	.000117			
14,750	59,000	.002250	.000183			
15,000	60,000	.002733	.000483	.000733	.000683	
15,250	61,000	.003300	.000567			
15,500	62,000	.004000	.000700			
15,750	63,000	.004850	.000850			
16,000	64,000	.005833	.000983			
16,250	65,000	.006833	.001000			
16,500	66,000	.008250	.001417			
16,750	67,000	.009017	.000767			
17,000	68,000	.009867	.000850			
17,250	69,000	.010467	.000600			
17,500	70,000	.011417	.000950			
18,000	72,000	.013533	.002116			
18,500	74,000	.015333	.001800			
19,000	76,000	.017550	.002217			
19,500	78,000	.019833	.002283			
20,000	80,000	.022000	.002167			
20,500	82,000	.024833	.002833			
21,000	84,000	.027417	.002584			
21,500	86,000	.030000	.002583			
22,000	88,000	.034000	.004000			
22,500	90,000	.037500	.003500			
23,000	92,000	.042000	.004500			
23,500	94,000	.047500	.005500			
24,000	96,000	.053667	.006167			
24,500	98,000	.0667	.013033			
25,000	100,000	.0833	.0166			
25,110	100,440	.1067	.0234			Tensile strength.
22,900						Load at time of rupture.

General summary.

Specific gravity		7.8561
Hardness		19.60
Tensile strength per square inch of original section	pounds..	100,440
Elastic limit per square inch of original section	do ...	55,000
Elongation per inch after rupture	inch..	0.1417
Elongation per inch under strain at elastic limit	do....	.001783
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1".2 from neck
Character of broken surface		granular with dull center
Elongation of inch sections		".23*, ".22*, ".11, ".10, ".10, ".09

No. 699.

Marks, B E X 3
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000350	.000217	.000017	.000017	
3,750	15,000	.000483	.000133	.000017	0.	
5,000	20,000	.000667	.000184	.000033	.000016	
6,250	25,000	.000800	.000133	.000033	0.	
7,500	30,000	.000983	.000183	.000033	0.	
8,750	35,000	.001150	.000167	.000033	0.	
10,000	40,000	.001300	.000150	.000033	0.	
10,250	41,000	.001333	.000033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001433	.000033	....	....	
11,250	45,000	.001483	.000050	.000050	.000017	
11,500	46,000	.001533	.000050	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001600	.000033	....	....	
12,250	49,000	.001617	.000017	....	....	
12,500	50,000	.001650	.000033	.000083	.000033	
12,750	51,000	.001683	.000033	....	....	
13,000	52,000	.001750	.000067	....	....	
13,250	53,000	.001783	.000033	....	....	
13,500	54,000	.001833	.000050	....	....	
13,750	55,000	.001850	.000017	.000100	.000017	Elastic limit.
14,000	56,000	.001967	.000117	....	....	
14,250	57,000	.002000	.000033	....	....	
14,500	58,000	.002117	.000117	....	....	
14,750	59,000	.002200	.000083	....	....	
15,000	60,000	.002600	.000400	.000600	.000500	
15,250	61,000	.002867	.000267	....	....	
15,500	62,000	.004100	.001233	....	....	
15,750	63,000	.004833	.000733	....	....	
16,000	64,000	.006217	.001384	....	....	
16,250	65,000	.006833	.000616	....	....	
16,500	66,000	.008200	.001367	....	....	
16,750	67,000	.009083	.000883	....	....	
17,000	68,000	.010333	.001250	....	....	
17,250	69,000	.011133	.000800	....	....	
17,500	70,000	.012183	.001050	....	....	
18,000	72,000	.014067	.001884	....	....	
18,500	74,000	.016650	.002583	....	....	
19,000	76,000	.018417	.001767	....	....	
19,500	78,000	.020967	.002550	....	....	
20,000	80,000	.023800	.002833	....	....	
20,500	82,000	.026250	.002450	....	....	
21,000	84,000	.029500	.003250	....	....	
21,500	86,000	.032533	.003033	....	....	
22,000	88,000	.036167	.003634	....	....	
22,500	90,000	.041083	.004916	....	....	
23,000	92,000	.0483	.007217	....	....	
23,500	94,000	.0550	.0067	....	....	
24,000	96,000	.0667	.0117	....	....	
24,500	98,000	.0883	.0216	....	....	
24,610	98,440	.1100	.0217	....	....	Tensile strength.
20,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	98,440
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain at elastic limit	do	.001850
Reduction in diameter at point of rupture	do	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		1″.3 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.21, ″.30, *.″13, ″.10, ″.08, ″.08

No. 701.

Marks, B E X 4
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000317	.000184	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000633	.000150	0.	....	
6, 250	25, 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001300	.000167	.000017	.000017	
10, 250	41, 000	.001317	.000017	....	....	
10, 500	42, 000	.001350	.000033	....	....	
10, 750	43, 000	.001367	.000017	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001450	.000050	.000017	0.	
11, 500	46, 000	.001467	.000017	....	....	
11, 750	47, 000	.001517	.000050	....	....	
12, 000	48, 000	.001583	.000066	....	....	
12, 250	49, 000	.001617	.000034	....	....	
12, 500	50, 000	.001650	.000033	.000033	.000016	
12, 750	51, 000	.001683	.000033	....	....	
13, 000	52, 000	.001717	.000034	....	....	
13, 250	53, 000	.001733	.000016	....	....	
13, 500	54, 000	.001767	.000034	....	....	
13, 750	55, 000	.001800	.000033	.000033	0.	
14, 000	56, 000	.001867	.000067	....	....	
14, 250	57, 000	.001900	.000033	....	....	Elastic limit.
14, 500	58, 000	.001967	.000067	....	....	
14, 750	59, 000	.002033	.000066	....	....	
15, 000	60, 000	.002117	.000084	.000183	.000150	
15, 250	61, 000	.002267	.000150	....	....	
15, 500	62, 000	.002617	.000350	....	....	
15, 750	63, 000	.003083	.000466	....	....	
16, 000	64, 000	.004333	.001250	....	....	
16, 250	65, 000	.005667	.001334	....	....	
16, 500	66, 000	.006667	.001000	....	....	
16, 750	67, 000	.007483	.000816	....	....	
17, 000	68, 000	.008283	.000800	....	....	
17, 250	69, 000	.009167	.000884	....	....	
17, 500	70, 000	.010467	.001300	....	....	
18, 000	72, 000	.012417	.001950	....	....	
18, 500	74, 000	.014167	.001750	....	....	
19, 000	76, 000	.016333	.002166	....	....	
19, 500	78, 000	.018667	.002334	....	....	
20, 000	80, 000	.021250	.002583	....	....	
20, 500	82, 000	.024167	.002917	....	....	
21, 000	84, 000	.026667	.002500	....	....	
21, 500	86, 000	.029417	.002750	....	....	
22, 000	88, 000	.033000	.003583	....	....	
22, 500	90, 000	.036833	.003833	....	....	
23, 000	92, 000	.041667	.004834	....	....	
23, 500	94, 000	.047250	.005583	....	....	
24, 000	96, 000	.054667	.007417	....	....	
24, 500	98, 000	.0650	.010333	....	....	
25, 000	100, 000	.0900	.0250	....	....	
25, 020	100, 080	.1083	.0183	....	....	Tensile strength.
21, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	100, 080
Elastic limit per square inch of original section	do	57, 000
Elongation per inch after rupture	inch	0. 1450
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		1″.3 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.20, ″.28*, ″.12, ″.10, ″.09, ″.08

Previous to making the tests, specimens B E X 2, B E X 5, and B E X 6 were subjected to rapidly applied stresses of 14,500 pounds, = 58,000 pounds per square inch, applied five times to each at intervals of ten minutes. The time of applying the stresses was about two seconds for each application.

No. 702.

Marks, B E X 2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000500	.000200	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000867	.000200	.000033	.000033	
7,500	30,000	.001033	.000166	.000050	.000017	
8,750	35,000	.001250	.000217	.000067	.000017	
10,000	40,000	.001433	.000183	.000083	.000016	
11,250	45,000	.001633	.000200	.000083	0.	
12,500	50,000	.001867	.000234	.000100	.000017	
12,750	51,000	.001917	.000050	....	....	
13,000	52,000	.001950	.000033	....	....	
13,250	53,000	.002017	.000067	....	....	
13,500	54,000	.002067	.000050	....	....	
13,750	55,000	.002117	.000050	.000133	.000033	
14,000	56,000	.002167	.000050	....	....	
14,250	57,000	.002200	.000033	....	....	
14,500	58,000	.002283	.000083	....	....	
14,750	59,000	.002333	.000050	....	....	
15,000	60,000	.002417	.000084	.000183	.000050	
15,250	61,000	.002450	.000033	....	....	
15,500	62,000	.002533	.000083	....	....	
15,750	63,000	.002583	.000050	....	....	Elastic limit.
16,000	64,000	.002700	.000117	....	....	
16,250	65,000	.002783	.000083	.000400	.000217	
16,500	66,000	.003233	.000450	....	....	
16,750	67,000	.003733	.000500	....	....	
17,000	68,000	.005517	.001784	....	....	
17,250	69,000	.006483	.000966	....	....	
17,500	70,000	.007567	.001084	.004767	.004367	
18,000	72,000	.009683	.002116	....	....	
18,500	74,000	.011167	.001484	....	....	
19,000	76,000	.013667	.002500	....	....	
19,500	78,000	.016833	.003166	....	....	
20,000	80,000	.019250	.002417	....	....	
20,500	82,000	.021217	.001967	....	....	
21,000	84,000	.024167	.002950	....	....	
21,500	86,000	.027500	.003333	....	....	
22,000	88,000	.030917	.003417	....	....	
22,500	90,000	.035717	.004800	....	....	
23,000	92,000	.042250	.006533	....	....	
23,500	94,000	.048500	.006250	....	....	
24,000	96,000	.058667	.010167	....	....	
24,500	98,000	.0750	.016333	....	....	
24,700	98,800	.1000	.0250	....	....	Tensile strength.
21,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	98,800
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1300
Elongation per inch under strain at elastic limit	do....	.002583
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.9 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.31*, ″.14, ″.10, ″.08, ″.08, ″07

No. 703.

Marks, B E X 5
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000317	.000200	0.	....	
3,750	15,000	.000450	.000133	0.	....	
5,000	20,000	.000683	.000233	.000017	.000017	
6,250	25,000	.000850	.000167	.000017	0.	
7,500	30,000	.001017	.000167	.000033	.000016	
8,750	35,000	.001200	.000183	.000033	0.	
10,000	40,000	.001400	.000200	.000033	0.	
11,250	45,000	.001600	.000200	.000033	0.	
12,500	50,000	.001867	.000267	.000033	0.	
12,750	51,000	.001883	.000016	....	....	
13,000	52,000	.001933	.000050	....	....	
13,250	53,000	.001967	.000034	....	....	
13,500	54,000	.002017	.000050	....	....	
13,750	55,000	.002050	.000033	.000050	.000017	
14,000	56,000	.002133	.000083	....	....	
14,250	57,000	.002167	.000034	....	....	
14,500	58,000	.002233	.000066	....	....	
14,750	59,000	.002283	.000050	....	....	
15,000	60,000	.002317	.000034	.000150	.000100	
15,250	61,000	.002383	.000066	....	....	
15,500	62,000	.002450	.000067	....	....	
15,750	63,000	.002517	.000067	....	....	Elastic limit.
16,000	64,000	.002667	.000150	....	....	
16,250	65,000	.002767	.000100	.000317	.000167	
16,500	66,000	.003083	.000316	....	....	
16,750	67,000	.003467	.000384	....	....	
17,000	68,000	.004833	.001366	....	....	
17,250	69,000	.006333	.001500	....	....	
17,500	70,000	.007500	.001167	.004733	.004416	
18,000	72,000	.009333	.001833	....	....	
18,500	74,000	.011667	.002334	....	....	
19,000	76,000	.014417	.002750	....	....	
19,500	78,000	.017500	.003083	....	....	
20,000	80,000	.019667	.002167	....	....	
20,500	82,000	.022667	.003000	....	....	
21,000	84,000	.026200	.003533	....	....	
21,500	86,000	.029667	.003467	....	....	
22,000	88,000	.033917	.004250	....	....	
22,500	90,000	.038833	.004916	....	....	
23,000	92,000	.045000	.006167	....	....	
23,500	94,000	.055333	.010333	....	....	
24,000	96,000	.0730	.019667	....	....	
24,300	97,200	.1167	.0417	....	....	Tensile strength.
20,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	97,200
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1700
Elongation per inch under strain at elastic limit	do....	.002517
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.85 from middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.10, ″.18, ″.37*, ″.15, ″.12, ″.10

No. 704.

Marks, B E X 6
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000667	.000200	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.001033	.000200	.000017	.000017	
8,750	35,000	.001217	.000184	.000017	0.	
10,000	40,000	.001433	.000216	.000033	.000016	
11,250	45,000	.001633	.000200	.000050	.000017	
12,500	50,000	.001833	.000200	.000067	.000017	
12,750	51,000	.001867	.000034	....	....	
13,000	52,000	.001950	.000083	....	....	
13,250	53,000	.001983	.000033	....	....	
13,500	54,000	.002033	.000050	....	....	
13,750	55,000	.002067	.000034	.000083	.000016	
14,000	56,000	.002133	.000066	....	....	
14,250	57,000	.002183	.000050	....	....	
14,500	58,000	.002233	.000050	....	....	
14,750	59,000	.002283	.000050	....	....	
15,000	60,000	.002367	.000084	.000167	.000084	
15,250	61,000	.002450	.000083	....	....	
15,500	62,000	.002550	.000100	....	....	
15,750	63,000	.002617	.000067	....	....	Elastic limit.
16,000	64,000	.002800	.000183	....	....	
16,250	65,000	.003350	.000550	.000933	.000766	
16,500	66,000	.004717	.001367	....	....	
16,750	67,000	.005283	.000566	....	....	
17,000	68,000	.005817	.000534	....	....	
17,250	69,000	.006917	.001100	....	....	
17,500	70,000	.008300	.001383	.005517	.004584	
18,000	72,000	.009950	.001650	....	....	
18,500	74,000	.011917	.001967	....	....	
19,000	76,000	.014333	.002416	....	....	
19,500	78,000	.016067	.002334	....	....	
20,000	80,000	.019200	.002533	....	....	
20,500	82,000	.021333	.002133	....	....	
21,000	84,000	.024167	.002834	....	....	
21,500	86,000	.026500	.002333	....	....	
22,000	88,000	.030250	.003750	....	....	
22,500	90,000	.034000	.003750	....	....	
23,000	92,000	.039033	.005033	....	....	
23,500	94,000	.044333	.005300	....	....	
24,000	96,000	.052500	.008167	....	....	
24,500	98,000	.0683	.0158	....	....	
25,000	100,000	.0950	.0267	....	....	
25,040	100,160	.1033	.0083	....	....	Tensile strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,160
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.002617
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.80 from neck
Character of broken surface		granular, dull center
Elongation of inch sections		″.29*, ″.13, ″.12, ″.10. ″.09, ″07

TABULATION OF TENSION SPECIMENS FROM EXPERIMENTAL SECTION, 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimens.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*				
351	Steel tube	Outside A	53,000	86,040	24.7	47.2	Silky, slightly granular			Before hooping experiment.
352		Middle B	54,000	89,820	24.0	47.2				
353		Inside C	44,000	84,000	20.0	44.6				
595	Steel tube	Middle 1	53,000	91,040	21.8	33.5	Fine granular, dull spot			Taken out after unhooping.
596		Inside 2	47,000	87,560	24.8	44.6	Silky and fine granular			
354	Steel jacket	Outside H	60,800	104,000	21.0	44.6	do			Before hooping experiment.
355		Middle I	52,800	93,280	20.0	33.4	Fine granular	7.8601	18.58	
356		Inside J	59,760	97,000	17.8	36.4	do			
392		Radial P	53,000	100,560	12.0	11.8	Granular			
393		Radial R	51,000	91,600	20.0	36.4	Silky 50 per cent., granular 50 per cent			
592	Steel jacket	Outside J_1	49,000	88,160	25.0	47.2	Fine silky			Taken out after unhooping.
593		Middle J_2	51,000	93,400	21.7	47.2	do			
594		Inside J_3	59,000	107,040	15.0	30.6	Fine granular, dull spot			
320	Steel hoop A_2	Inside 1	62,000	107,280	18.2	41.9	Fine granular and dull smoky	7.8609	23.84	Before hooping experiment.
321		Outside 2	62,000	107,200	16.7	41.9	do			
324		Inside 3	65,000	105,200	19.8	52.2	Silky and fine granular			
325		Outside 4	66,000	109,240	17.7	44.6	Fine granular, dull center			
382		Middle 5	62,000	105,160	15.8	54.6	Fine silky and granular			
383		Middle 6	59,000	105,360	14.5	44.6	Silky and granular			
705	Steel hoop A_2	Middle 1	57,000	100,440	16.7	49.7	Silky, traces of granulation	7.8576	20.14	Taken out after unhooping.
706		Inside 2	59,000	99,680	16.8	54.6	Fine silky			
707		Middle 3	61,000	103,160	18.0	54.6	do			
822	Steel hoop B_2	Inside 1	58,000	103,280	16.0	39.2	Fine granular and dull smoky	7.8583	22.26	Before hooping experiment.
823		Middle 2	55,000	101,840	15.7	39.2	do			
826		Inside 3	61,000	104,360	18.7	39.2	Fine granular and dull spot			
827		Outside 4	60,000	104,000	18.7	39.2	Fine granular and dull smoky			
700	Steel hoop B_2	Outside 1	55,000	100,440	14.2	39.2	Granular, dull center	7.8561	19.60	After unhooping.
699		Middle 3	55,000	98,440	15.0	47.2	Silky and fine granular			
701		Inside 4	57,000	100,050	14.5	44.6	do			
702		Inside 2	63,000	98,800	13.0	30.2	Fine granular, dull center			
703		Outside 5	63,000	97,200	17.0	44.6	do			
704		Inside 6	63,000	100,160	13.8	39.2	Granular, dull center			

TABULATION OF COMPRESSION SPECIMENS FROM EXPERIMENTAL SECTION, 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimens.	Length.	Diameter.	Sectional area.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*		
385	Steel tube	Inside D	5.00	.798	.50	44,000	....	....	Before hooping experiment.
384	....	Outside E	5.00	.798	.50	49,000			
388	....	Radial F	3.98	.798	.50	48,000			
389	....	Radial G	3.98	.798	.50	38,000			
407	....	Radial O	3.992	.798	.50	37,000			
489	Steel tube	Middle 1	5.00	.798	.50	53,000	80,600	Triple flexure	After unhooping.
490	....	Inside 2	5.00	.798	.50	50,000	78,400		
386	Steel jacket	Middle K	4.98	.798	.50	59,000	....	....	Before hooping experiment.
387	....	Middle L	4.97	.798	.50	49,000			
390	....	Radial M	3.98	.798	.50	57,000			
391	....	Radial N	3.98	.798	.50	54,000			
486	Steel jacket	Outside J_1	5.00	.798	.50	57,000	88,760	Triple flexure	After unhooping.
487	....	Middle J_2	5.00	.798	.50	55,000	87,840		
488	....	Inside J_3	5.00	.798	.50	58,000	87,920		

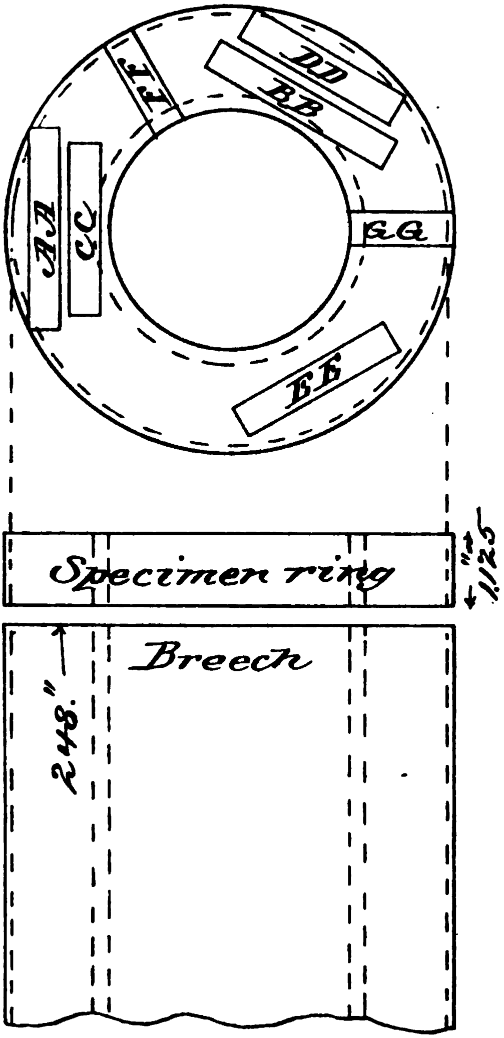
3.—8″ STEEL B. L. RIFLE.

[Steel specimens from tube, jacket, hoops and breech block, and bronze from console.)

8" Steel B.L. Rifle.

1st Tube

Whitworth manufacture.



No. 375.

Tension Test.

Mark on bar, A A
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.00.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	. 000067	. 000067	0.	....	
2, 500	10, 000	. 000233	. 000166	0.	....	
3, 750	15, 000	. 000400	. 000167	0.	....	
5, 000	20, 000	. 000567	. 000167	0.	....	
6, 250	25, 000	. 000733	. 000166	0.	....	
7, 500	30, 000	. 000933	. 000200	. 000067	. 000067	
7, 750	81, 000	. 001000	. 000067	....	....	
8, 000	32, 000	. 001033	. 000033	....	....	
8, 250	83, 000	. 001067	. 000034	....	....	
8, 500	34, 000	. 001200	. 000133	....	....	
8, 750	35, 000	. 001267	. 000067	. 000200	. 000133	
9, 000	36, 000	. 001333	. 000066	....	....	
9, 250	37, 000	. 001400	. 000067	....	....	Elastic limit.
9, 500	38, 000	. 001700	. 000300	....	....	
9, 750	39, 000	. 001900	. 000200	....	....	
10, 000	40, 000	. 002433	. 000533	. 001100	. 000900	
10, 250	41, 000	. 002700	. 000267	....	....	
10, 500	42, 000	. 003367	. 000667	....	....	
10, 750	43, 000	. 004133	. 000766	....	....	
11, 000	44, 000	. 005333	. 001200	....	....	
11, 250	45, 000	. 005933	. 000600	. 004267	. 003167	
11, 500	46, 000	. 006700	. 000767	....	....	
11, 750	47, 000	. 007533	. 000833	....	....	
12, 000	48, 000	. 008533	. 001000	....	....	
12, 250	49, 000	. 009167	. 000634	....	....	
12, 500	50, 000	. 010500	. 001333	. 008533	. 004266	
13, 000	52, 000	. 012000	. 001500	....	....	
13, 500	54, 000	. 013500	. 001500	....	....	
14, 000	56, 000	. 015667	. 002167	....	....	
14, 500	58, 000	. 018200	. 002533	....	....	
15, 000	60, 000	. 019933	. 001733	....	....	
15, 500	62, 000	. 022267	. 002334	....	....	
16, 000	64, 000	. 024933	. 002666	....	....	
16, 500	66, 000	. 028867	. 003934	....	....	
17, 000	68, 000	. 031600	. 002733	....	....	
17, 500	70, 000	. 035400	. 003800	....	....	Micrometer removed.
18, 000	72, 000	. 0433	. 0070	....	....	
18, 500	74, 000	. 0500	. 0067	....	....	
19, 000	76, 000	. 0533	. 0033	....	....	
19, 500	78, 000	. 0600	. 0067	....	....	
20, 000	80, 000	. 0700	. 0100	....	....	
20, 500	82, 000	. 0833	. 0133	....	....	
21, 000	84, 000	. 0967	. 0134	....	....	
21, 500	86, 000	. 1300	. 0333	....	....	
21, 720	86, 880	. 1667	. 0367	....	....	Ultimate strength.
21, 100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	86, 880
Elastic limit per square inch of original section	do....	37, 000
Elongation per inch after rupture	inch..	0. 2133
Elongation per inch under strain at elastic limit	do....	. 001400
Reduction in diameter at point of rupture	do....	. 094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		″. 35 from middle of stem

Character of broken surface, granular, 70 per cent., 30 per cent. of the fracture took an oblique course across the bar, apparently through a seam.

Elongation of inch sections.................. .. .. ″. 14, (″.29 fractured section) ″.21

No. 376.

Tension Test.

Mark on bar, B R
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".00.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000633	.000233	.000133	.000133	
6,250	25,000	.000900	.000267	.000167	.000034	
7,500	30,000	.001133	.000233	.000233	.000066	
7,750	31,000	.001200	.000067	....	....	
8,000	32,000	.001267	.000067	....	....	
8,250	33,000	.001300	.000033	....	....	Elastic limit.
8,500	34,000	.001533	.000233	....	....	
8,750	35,000	.002067	.000534	.001067	.000834	
9,000	36,000	.003300	.001233	....	....	
9,250	37,000	.004100	.000800	....	....	
9,500	38,000	.006267	.002167	....	....	
9,750	39,000	.006767	.000500	....	....	
10,000	40,000	.007967	.001200	.006433	.005366	
10,250	41,000	.008300	.000333	....	....	
10,500	42,000	.009267	.000967	....	....	
10,750	43,000	.009867	.000600	....	....	
11,000	44,000	.010533	.000666	....	....	
11,250	45,000	.011833	.001300	.010233	.003800	
11,500	46,000	.012767	.000934	....	....	
11,750	47,000	.013600	.000833	....	....	
12,000	48,000	.015100	.001500	....	....	
12,250	49,000	.016000	.000900	....	....	
12,500	50,000	.017333	.001333	.015433	.005200	
13,000	52,000	.019400	.002067	....	....	
13,500	54,000	.021933	.002533	....	....	
14,000	56,000	.024600	.002667	....	....	
14,500	58,000	.027600	.003000	....	....	
15,000	60,000	.031667	.004067	....	....	
15,500	62,000	.035767	.004100	....	....	
16,000	64,000	.038733	.002966	....	....	
16,500	66,000	.044667	.005934	....	....	
17,000	68,000	.050333	.005666	....	....	
17,500	70,000	.058000	.007667	....	....	Micrometer removed.
18,000	72,000	.0633	.0053	....	....	
18,500	74,000	.0783	.0150	....	....	
19,000	76,000	.0933	.0150	....	....	
19,500	78,000	.1167	.0234	....	....	
19,720	78,880	.1500	.0333	....	....	Ultimate strength.
18,800	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8622
Hardness	12.31
Tensile strength per square inch of original section .....pounds..	78,880
Elastic limit per square inch of original section .....do....	33,000
Elongation per inch after rupture .....inch..	0.19
Elongation per inch under strain at elastic limit .....do....	.001300
Reduction in diameter at point of rupture .....do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	".60 from neck
Character of broken surface	Fine granular, dull spot at circumference of fractured surface; fine cracks developed on cylindrical surface of bar, in the vicinity of the fracture.
Elongation of inch sections	".13, ".15 (".29 fractured section)

No. 392.

Compression Test.

Marks on bar, C C
Length, 5''.00.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000075	.000075	0.	....	
5,000	10,000	.000250	.000175	0.	....	
7,500	15,000	.000425	.000175	0.	....	
10,000	20,000	.000525	.000100	0.	....	
12,500	25,000	.000700	.000175	0.	....	
13,000	26,000	.000750	.000050	....	....	
13,500	27,000	.000775	.000025	....	....	
14,000	28,000	.000800	.000025	....	....	
14,500	29,000	.000825	.000025	....	....	
15,000	30,000	.000850	.000025	0.	....	
15,500	31,000	.000900	.000050	....	....	
16,000	32,000	.000975	.000075	....	....	
16,500	33,000	.001000	.000025	....	....	
17,000	34,000	.001025	.000025	....	....	
17,500	35,000	.001050	.000025	0.	....	
18,000	36,000	.001125	.000075	....	....	Elastic limit.
18,500	37,000	.001550	.000425	....	....	Rapid deflection.
19,000	38,000	.002300	.000750	....	....	
19,500	39,000	.003625	.001325	....	....	
20,000	40,000	.004225	.000600	....	....	Rested under load 1 hour.
		.004450	.000225	.003000	.003000	After 1 hour's rest.
20,500	41,000	.004675	.000225	....	....	
21,000	42,000	.005225	.000550	....	....	
21,500	43,000	.006050	.000825	....	....	
22,000	44,000	.006675	.000625	....	....	
22,500	45,000	.007400	.000725	.005750	.0027500	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	36,000
Compression per inch under stress at elastic limit	inch..	0.001125

No. 393.

Compression Test.

Marks on bar, D D
Length, 5″.00.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000150	.000150	0.	....	
5,000	10,000	.000300	.000150	0.	....	
7,500	15,000	.000450	.000150	0.	....	
10,000	20,000	.000600	.000150	0.	....	
12,500	25,000	.000750	.000150	0.	....	
13,000	26,000	.000875	.000125	....	....	
13,500	27,000	.000900	.000025	....	....	
14,000	28,000	.000925	.000025	....	....	
14,500	29,000	.000975	.000050	....	....	
15,000	30,000	.001000	.000025	.000050	.000050	
15,500	31,000	.001050	.000050	....	....	
16,000	32,000	.001075	.000025	....	....	Elastic limit.
16,500	33,000	.001150	.000075	....	....	
17,000	34,000	.001225	.000075	....	....	
17,500	35,000	.001300	.000075	.000250	.000200	
18,000	36,000	.001525	.000225	....	....	Rapid deflection.
18,500	37,000	.002050	.000525	....	....	
19,000	38,000	.002925	.000875	....	....	
19,500	39,000	.004050	.001125	....	....	
20,000	40,000	.004925	.000875	.003425	.003175	
20,500	41,000	.005725	.000800	....	....	
21,000	42,000	.006575	.000850	....	....	
21,500	43,000	.007725	.001230	....	....	
22,000	44,000	.008450	.000725	....	....	
22,500	45,000	.009500	.001050	.007725	.004300	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	32,000
Compression per inch under stress at elastic limit	inch..	0.001075

No. 394.

Compression Test.

Marks on bar, E E
Length 5''.00.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000175	.000175	0.	....	
5, 000	10, 000	.000325	.000150	0.	....	
7, 500	15, 000	.000450	.000125	0.	....	
10, 000	20, 000	.000600	.000150	.000075	.000075	
12, 500	25, 000	.000800	.000200	.000100	.000025	
13, 000	26, 000	.000875	.000075	....	....	
13, 500	27, 000	.000925	.000050	....	....	
14, 000	28, 000	.000950	.000025	....	....	
14, 500	29, 000	.000975	.000025	....	....	
15, 000	30, 000	.001025	.000050	.000125	.000025	
15, 500	31, 000	.001075	.000050	....	....	
16, 000	32, 000	.001150	.000075	....	....	
16, 500	33, 000	.001200	.000050	....	....	Elastic limit.
17, 000	34, 000	.001300	.000100	....	....	
17, 500	35, 000	.001875	.000575	.000800	.000675	Rapid deflection.
18, 000	36, 000	.004475	.002600	....	....	
18, 500	37, 000	.005800	.001325	....	....	
19, 000	38, 000	.006500	.000700	....	....	
19, 500	39, 000	.007275	.000775	....	....	
20, 000	40, 000	.008175	.000900	.006750	.005950	
20, 500	41, 000	.008825	.000650	....	....	
21, 000	42, 000	.009800	.000975	....	....	
21, 500	43, 000	.010575	.000775	....	....	
22, 000	44, 000	.011500	.000925	....	....	
22, 500	45, 000	.012550	.001050	.011000	.004250	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	33, 000
Compression per inch under stress at elastic limit	inch..	''0. 001200

No. 399.

Compression Test.

[Crushing.]

Marks on bar, F F
Length, 3″.005.
Diameter, ″.7965.
Sectional area, .498 square inch.
Specimen loaded with 74,700 pounds=150,000 pounds per square inch.
Distortion took place by deflecting laterally, and the sides swelling.
Length of specimen after the test, 1″.68.

No. 400.

Compression Test.

[Crushing.]

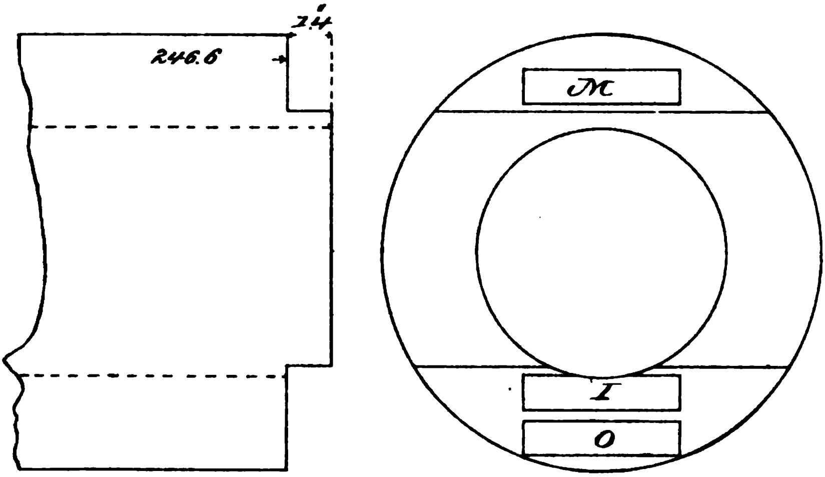
Marks on bar G G
Length, 3″.003.
Diameter, ″.7965.
Sectional area, .498 square inch.
Specimen loaded with 74,700 pounds=150,000 pounds per square inch.
Distortion took place by deflecting laterally, and the sides swelling.
Length of specimen after the test, 1″.65.

8" Steel B.L. Rifle.

1st Tube

Muzzle end.

Whitworth manufacture.



No. 428.

Tension Test.

Mark on bar, I
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000400	.000150	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000700	.000100	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001050	.000150	0.	....	
10,000	40,000	.001250	.000200	0.	....	
10,250	41,000	.001350	.000100	....	....	
10,500	42,000	.001350	0.	....	....	
10,750	43,000	.001400	.000050	....	....	
11,000	44,000	.001450	.000050	....	....	
11,250	45,000	.001500	.000050	.000050	.000050	
11,500	46,000	.001500	0.	....	....	
11,750	47,000	.001500	0.	....	....	
12,000	48,000	.001550	.000050	....	....	
12,250	49,000	.001600	.000050	....	....	
12,500	50,000	.001700	.000100	.000150	.000100	
12,750	51,000	.001850	.000150	....	....	Elastic limit.
13,000	52,000	.006350	.004500	....	....	
13,250	53,000	.006900	.000550	....	....	
13,500	54,000	.007500	.000600	....	....	
13,750	55,000	.008100	.000600	.006100	.005950	
14,000	56,000	.008850	.000750	....	....	
14,250	57,000	.009450	.000600	....	....	
14,500	58,000	.010050	.000600	....	....	
14,750	59,000	.010900	.000850	....	....	
15,000	60,000	.012100	.001200	.009800	003700	
15,500	62,000	.013150	.001050	....	....	
16,000	64,000	.015400	.002250	....	....	
16,500	66,000	.017350	.001950	....	....	
17,000	68,000	.018600	.001250	....	....	
17,500	70,000	.020900	.002300	....	....	
18,000	72,000	.023250	.002350	....	....	
18,500	74,000	.025750	.002500	....	....	
19,000	76,000	.028550	.002800	....	....	
19,500	78,000	.031500	.002950	....	....	
20,000	80,000	.036050	.004550	....	....	
20,500	82,000	.038550	.002500	....	....	
21,000	84,000	.042400	.003850	....	....	
21,500	86,000	.047850	.005450	....	....	
22,000	88,000	.054000	.006150	....	....	
22,500	90,000	.060500	.006500	....	....	
23,000	92,000	.070000	.009500	....	....	
23,500	94,000	.083500	.013500	....	....	
24,000	96,000	.110000	.026500	....	....	
24,300	97,200	.1700	.0600	....	....	Ultimate strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	97,200
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.184
Reduction of area after rupture, per centum of original section		41.9
Position of rupture		at middle of stem
Character of broken surface		silky

No. 429.

Tension Test.

Mark on bar, M
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	0.		
2,500	10,000	.000100	.000100	0.		
3,750	15,000	.000200	.000100	0.		
5,000	20,000	.000300	.000100	0.		
6,250	25,000	.000400	.000100	0.		
7,500	30,000	.000500	.000100	0.		
8,750	35,000	.000650	.000150	0.		
10,000	40,000	.000900	.000250	0.		
10,250	41,000	.000900	0.			
10,500	42,000	.000950	.000050			
10,750	43,000	.000950	0.			
11,000	44,000	.001000	.000050			
11,250	45,000	.001050	.000050	0.		
11,500	46,000	.001050	0.			
11,750	47,000	.001050	0.			
12,000	48,000	.001100	.000050			
12,250	49,000	.001150	.000050			
12,500	50,000	.001200	.000050	0.		
12,750	51,000	.001250	.000050			
13,000	52,000	.001250	0.			
13,250	53,000	.001300	.000050			Elastic limit.
13,500	54,000	.001400	.000100			
13,750	55,000	.001700	.000300	.000200	.000200	
14,000	56,000	.006050	.004350			
14,250	57,000	.006400	.000350			
14,500	58,000	.007150	.000750			
14,750	59,000	.007900	.000750			
15,000	60,000	.008750	.000850	.006400	.006200	
15,500	62,000	.009500	.000750			
16,000	64,000	.011250	.001750			
16,500	66,000	.013100	.001850			
17,000	68,000	.014550	.001450			
17,500	70,000	.016250	.001700			
18,000	72,000	.018000	.001750			
18,500	74,000	.020000	.002000			
19,000	76,000	.022400	.002400			
19,500	78,000	.024600	.002200			
20,000	80,000	.026900	.002300			
20,500	82,000	.030000	.003100			
21,000	84,000	.032750	.002750			
21,500	86,000	.036500	.003750			
22,000	88,000	.040250	.003750			
22,500	90,000	.046000	.005750			
23,000	92,000	.050500	.004500			
23,500	94,000	.057500	.007000			
24,000	96,000	.066000	.008500			
24,500	98,000	.079500	.013500			
25,000	100,000	.1100	.0305			
25,060	100,240	.1250	.0150			Ultimate strength.
22,800						Load at time of rupture.

General summary.

Specific gravity		7.8521
Hardness		19.60
Tensile strength per square inch of original section	pounds..	100,240
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.2000
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.40 from middle of stem
Character of broken surface		silky

No. 430.

Tension Test.

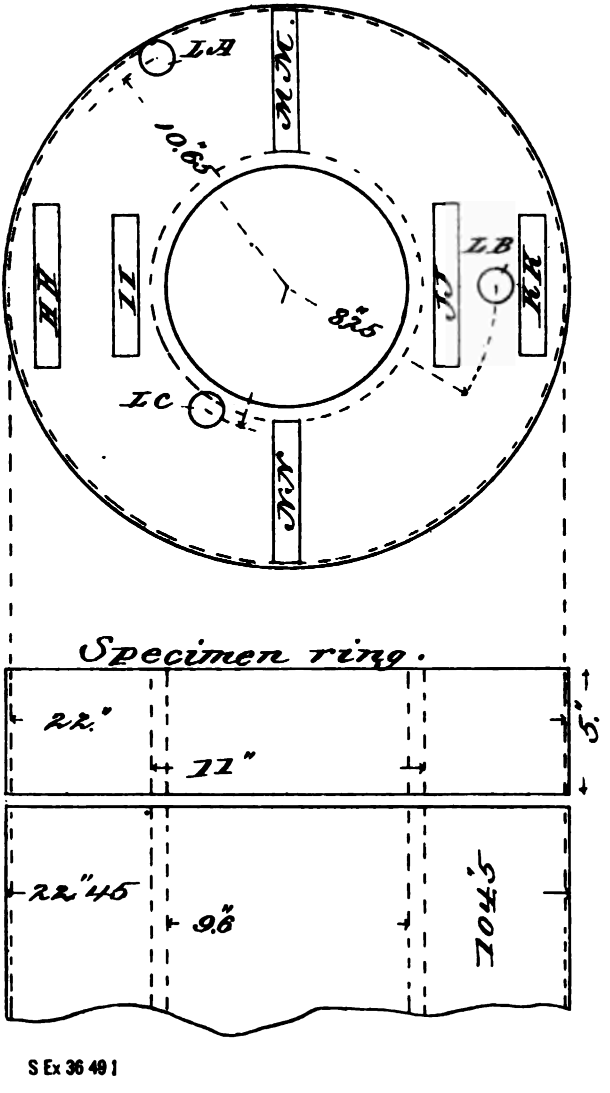
Mark on bar, O
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	0.	....	
2,500	10,000	.000100	.000100	0.	....	
3,750	15,000	.000200	.000100	0.	....	
5,000	20,000	.000300	.000100	0.	....	
6,250	25,000	.000450	.000150	0.	....	
7,500	30,000	.000650	.000200	0.	....	
8,750	35,000	.000850	.000200	0.	....	
10,000	40,000	.000950	.000100	0.	....	
10,250	41,000	.000950	0.	....	....	
10,500	42,000	.001000	.000050	....	....	
10,750	43,000	.001050	.000050	....	....	
11,000	44,000	.001100	.000050	....	....	
11,250	45,000	.001150	.000050	0.	....	
11,500	46,000	.001150	0.	....	....	
11,750	47,000	.001150	0.	....	....	
12,000	48,000	.001200	.000050	....	....	
12,250	49,000	.001250	.000050	....	....	
12,500	50,000	.001300	.000050	0.	....	
12,750	51,000	.001350	.000050	....	....	
13,000	52,000	.001400	.000050	....	....	
13,250	53,000	.001450	.000050	....	....	
13,500	54,000	.001500	.000050	....	....	
13,750	55,000	.001500	0.	.0	....	
14,000	56,000	.001550	.000050	....	....	
14,250	57,000	.001600	.000050	....	....	
14,500	58,000	.001650	.000050	....	....	Elastic limit.
14,750	59,000	.007600	.005950	....	....	
15,000	60,000	.007900	.000300	.006150	.006150	
15,500	62,000	.009250	.001350	....	....	
16,000	64,000	.010600	.001350	....	....	
16,500	66,000	.012150	.001550	....	....	
17,000	68,000	.013900	.001750	....	....	
17,500	70,000	.015500	.001600	....	....	
18,000	72,000	.017500	.002000	....	....	
18,500	74,000	.019450	.001950	....	....	
19,000	76,000	.021400	.001950	....	....	
19,500	78,000	.023100	.001700	....	....	
20,000	80,000	.025600	.002500	....	....	
20,500	82,000	.028500	.002900	....	....	
21,000	84,000	.032000	.003500	....	....	
21,500	86,000	.034500	.002500	....	....	
22,000	88,000	.038600	.004100	....	....	
22,500	90,000	.042500	.003900	....	....	
23,000	92,000	.047[illegible]0	.004500	....	....	
23,500	94,000	.053500	.006500	....	....	
24,000	96,000	.060500	.007000	....	....	
24,500	98,000	.070500	.010000	....	....	
25,000	100,000	.085000	.014500	....	....	
25,480	101,920	.1400	.0550	....	....	Ultimate strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	101,920
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.2750
Elongation per inch under strain at elastic limit	do	.001650
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.25 from middle of stem
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.

8" Steel B.L. Rifle
1st Jacket
Whitworth manufacture



No. 378.

Tension Test.

Marks on bar, H H
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	....	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	.000033	.000033	
5,250	21,000	.000600	0.	....	....	
5,500	22,000	.000633	.000033	....	....	
5,750	23,000	.000667	.000034	....	....	
6,000	24,000	.000700	.000033	....	....	
6,250	25,000	.000733	.000033	.000067	.000034	
6,500	26,000	.000767	.000034	....	....	
6,750	27,000	.000800	.000033	....	....	
7,000	28,000	.000833	.000033	....	....	
7,250	29,000	.000867	.000034	....	....	
7,500	30,000	.000900	.000033	.000100	.000033	
7,750	31,000	.000933	.000033	....	....	
8,000	32,000	.001000	.000067	....	....	
8,250	33,000	.001000	0.	....	....	
8,500	34,000	.001033	.000033	....	....	
8,750	35,000	.001067	.000034	.000100	0.	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	.001233	.000033	.000100	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001823	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000100	0.	
11,500	46,000	.001400	0.	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001500	.000033	....	....	
12,500	50,000	.001533	.000033	.000100	0.	Elastic limit.
12,750	51,000	.001733	.000200	....	....	
Rapid stretching. Load fell to 47,000 pounds per square inch.						
11,750	47,000	.006667	.004934	....	....	
12,750	51,000	.011833	.005166	....	....	
13,000	52,000	.012033	.000200	....	....	
13,250	53,000	.012333	.000300	....	....	
13,500	54,000	.013367	.001034	....	....	
13,750	55,000	.014100	.000733	.012033	.011933	
14,000	56,000	.015233	.001133	....	....	
14,250	57,000	.015900	.000667	....	....	
14,500	58,000	.016867	.000967	....	....	
14,750	59,000	.018100	.001233	....	....	
15,000	60,000	.019233	.001133	.010800	.004767	
15,500	62,000	.021600	.002367	....	....	
16,000	64,000	.024067	.002467	....	....	
16,500	66,000	.027067	.003000	....	....	
17,000	68,000	.030367	.003300	....	....	
17,500	70,000	.033333	.002966	....	....	
18,000	72,000	.037400	.004067	....	....	
18,500	74,000	.042000	.004600	....	....	
19,000	76,000	.046667	.004667	....	....	
19,500	78,000	.052833	.006166	....	....	
20,000	80,000	.060500	.007667	....	....	
20,500	82,000	.068700	.008200	....	....	Micrometer removed.
21,000	84,000	.0833	.0146	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
21,500	86,000	.1033	.0200	....	....	
22,000	88,000	.1433	.0400	....	....	
22,100	88,400	.1767	.0334	....	....	Ultimate strength.
19,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88,400
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.2283
Elongation per inch under strain at elastic limit	do....	.001583
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".90 from neck
Character of broken surface		fine silky, trace of granulation
Elongation of inch sections		".11, ".17 " (".39 fractured section)

No. 377.

Tension Test.

Marks on bar, J J
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000800	.000200	.000100	....	
7,500	30,000	.001800	.000500	.000367	....	Elastic limit.
7,750	31,000	.001967	.000667	....	....	
8,000	32,000	.002633	.000666	....	....	
8,250	33,000	.003100	.000467	....	....	
8,500	34,000	.003967	.000867	....	....	
8,750	35,000	.004500	.000533	.003267	.002967	
9,000	36,000	.005333	.000833	....	....	
9,250	37,000	.006000	.000667	....	....	
9,500	38,000	.006933	.000933	....	....	
9,750	39,000	.007467	.000534	....	....	
10,000	40,000	.008300	.000833	.006833	.003566	
10,250	41,000	.008933	.000633	....	....	
10,500	42,000	.009767	.000834	....	....	
10,750	43,000	.010600	.000833	....	....	
11,000	44,000	.011933	.001333	....	....	
11,250	45,000	.012600	.000667	.010833	.004000	
11,500	46,000	.013700	.001100	....	....	
11,750	47,000	.014433	.000733	....	....	
12,000	48,000	.015733	.001300	....	....	
12,250	49,000	.016567	.000834	....	....	
12,500	50,000	.018100	.001533	.016067	.005234	
13,000	52,000	.020067	.001967	....	....	
13,500	54,000	.022900	.002833	....	....	
14,000	56,000	.025400	.002500	....	....	
14,500	58,000	.028100	.002700	....	....	
15,000	60,000	.031800	.003200	....	....	
15,500	62,000	.035400	.004100	....	....	
16,000	64,000	.039733	.004333	....	....	
16,500	66,000	.045633	.005900	....	....	
17,000	68,000	.050600	.004967	....	....	
17,500	70,000	.059667	.009067	....	....	Micrometer removed.
18,000	72,000	.0700	.010333	....	....	
18,500	74,000	.0800	.0100	....	....	
19,000	76,000	.0967	.0167	....	....	
19,500	78,000	.1267	.0300	....	....	
19,830	79,820	.1800	.0533	....	....	Ultimate strength.
17,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8659
Hardness		12.60
Tensile strength per square inch of original section	pounds..	79,320
Elastic limit per square inch of original section	do....	30,000
Elongation per inch after rupture	inch..	0.2333
Elongation per inch under strain at elastic limit	do....	.001300
Reduction of diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.10 from neck

Character of broken surface, granular, dull spot at circumference, and small dull pockets in the granular metal. Cracks developed on the cylindrical surface of bar in the vicinity of fracture.

Elongation of inch sections .... ″.17, ″.27 (″.26 fractured section)

No. 379.

Tension Test.

Marks on bar, L A
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000200	.000100	0.		
3,750	15,000	.000400	.000200	0.		
5,000	20,000	.000550	.000150	0.		
6,250	25,000	.000650	.000100	.000050	.000050	
6,500	26,000	.000750	.000100			
6,750	27,000	.000800	.000050			
7,000	28,000	.000850	.000050			
7,250	29,000	.000900	.000050			
7,500	30,000	.000900	0.	.000050	0.	
7,750	31,000	.000900	0.			
8,000	32,000	.000950	.000050			
8,250	33,000	.001000	.000050			
8,500	34,000	.001000	0.			
8,750	35,000	.001000	0.	.000050	0.	
9,000	36,000	.001100	.000100			
9,250	37,000	.001150	.000050			
9,500	38,000	.001150	0.			
9,750	39,000	.001200	.000050			
10,000	40,000	.001200	0.	.000050	0.	
10,250	41,000	.001250	.000050			
10,500	42,000	.001300	.000050			
10,750	43,000	.001300	0.			
11,000	44,000	.001350	.000050			
11,250	45,000	.001350	0.	.000050	0.	
11,500	46,000	.001400	.000050			
11,750	47,000	.001450	.000050			
12,000	48,000	.001500	.000050			
12,250	49,000	.001500	0.			
12,500	50,000	.001550	.000050	.000050	0.	
12,750	51,000	.001550	0.			
13,000	52,000	.001600	.000050			
13,250	53,000	.001600	0.			
13,500	54,000	.001650	.000050			
13,750	55,000	.001750	.000100	.000050	.000100	Elastic limit.
14,000	56,000	.008350	.006600			
14,250	57,000	.008550	.000200			
14,500	58,000	.009400	.000850			
14,750	59,000	.009700	.000300			
15,000	60,000	.010650	.000950	.008400	.008250	
15,500	62,000	.011850	.001200			
16,000	64,000	.014250	.002400			
16,500	66,000	.015850	.001600			
17,000	68,000	.017750	.001900			
17,500	70,000	.020050	.002300			
18,000	72,000	.022050	.002000			
18,500	74,000	.025150	.003100			
19,000	76,000	.027050	.001900			
19,500	78,000	.030200	.003150			
20,000	80,000	.033650	.003450			Micrometer removed.
20,500	82,000	.0350	.001350			
21,000	84,000	.0375	.0025			
21,500	86,000	.0400	.0025			
22,000	88,000	.0475	.0075			
22,500	90,000	.0550	.0075			
23,000	92,000	.0630	.0100			
23,500	94,000	.0800	.0150			
24,000	96,000	.1100	.0300			
24,070	96,280	.1350	.0250			Ultimate strength.
20,000						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	96,280
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.255
Elongation per inch under strain at elastic limit	do	.001750
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.75 from neck
Character of broken surface		fine silky, trace of granulation; cup-shaped ends
Elongation of inch sections		″.14 (″.37 fractured section)

No. 380.

Tension Test.

Marks on bar, L B
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	.0	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000350	.000100	0.	....	
5,000	20,000	.000550	.000200	0.	....	
5,250	21,000	.000550	0.	....	....	
5,500	22,000	.000600	.000050	....	....	
5,750	23,000	.000650	.000050	....	....	
6,000	24,000	.000650	0.	....	....	
6,250	25,000	.000700	.000050	.000050	.000050	
6,500	26,000	.000750	.000050	....	....	
6,750	27,000	.000800	.000050	....	....	
7,000	28,000	.000900	.000100	....	....	
7,250	29,000	.000950	.000050	....	....	
7,500	30,000	.001000	.000050	.000100	.000050	
7,750	31,000	.001050	.000050	....	....	Elastic limit.
8,000	32,000	.001150	.000100	....	....	
8,250	33,000	.001250	.000100	....	....	
8,500	34,000	.001400	.000150	....	....	
8,750	35,000	.001800	.000400	.000650	.000550	
9,000	36,000	.002150	.000350	....	....	
9,250	37,000	.002650	.000500	....	....	
9,500	38,000	.004100	.001450	....	....	
9,750	39,000	.004900	.000800	....	....	
10,000	40,000	.006000	.001100	.004450	.003800	
10,250	41,000	.006500	.000500	....	....	
10,500	42,000	.007500	.001000	....	....	
10,750	43,000	.008200	.000700	....	....	
11,000	44,000	.009000	.000800	....	....	
11,250	45,000	.009750	.000750	.007950	.003500	
11,500	46,000	.010500	.000750	....	....	
11,750	47,000	.011000	.000500	....	....	
12,000	48,000	.012250	.001250	....	....	
12,250	49,000	.012800	.000550	....	....	
12,500	50,000	.014400	.001600	.012250	.004300	
13,000	52,000	.016100	.001700	....	....	
13,500	54,000	.018250	.002150	....	....	
14,000	56,000	.020200	.002000	....	....	
14,500	58,000	.023250	.003050	....	....	
15,000	60,000	.025400	.002150	....	....	
15,500	62,000	.028700	.003300	....	....	
16,000	64,000	.032250	.003550	....	....	
16,500	66,000	.035350	.003100	....	....	
17,000	68,000	.039550	.004200	....	....	
17,500	70,000	.045650	.006100	....	....	
18,000	72,000	.050000	.004350	....	....	
18,500	74,000	.059350	.009350	....	....	
19,000	76,000	.067600	.008250	....	....	
19,500	78,000	.080000	.012400	....	....	Micrometer removed.
20,000	80,000	.1000	.0200	....	....	
20,500	82,000	.1325	.0325	....	....	
20,710	82,840	.1750	.0425	....	....	Ultimate strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	82,840
Elastic limit per square inch of original section	do....	31,000
Elongation per inch after rupture	inch..	0.315
Elongation per inch under strain at elastic limit	do....	.001050
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.85 from neck

Character of broken surface..granular and dull spongy. Cylindrical surface of bar mottled in vicinity of fracture.

Elongation of inch sections... ″.19 (″.44 fractured section)

No. 381.

Tension Test.

Marks on bar, L C
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000250	.000150	0.		
3,750	15,000	.000450	.000200	0.		
5,000	20,000	.000550	.000100	.000050		
5,250	21,000	.000600	.000050			
5,500	22,000	.000650	.000050			
5,750	23,000	.000700	.000050			
6,000	24,000	.000800	.000100			
6,250	25,000	.000850	.000050	.000050		
6,500	26,000	.000850	0.			
6,750	27,000	.000850	0.			
7,000	28,000	·000900	.000050			
7,250	29,000	.000950	.000050			
7,500	30,000	.001000	.000050	.000100	.000050	
7,750	31,000	.001050	.000050			
8,000	32,000	.001050	0.			
8,250	33,000	.001100	.000050			
8,500	34,000	.001150	.000050			Elastic limit.
8,750	35,000	.001250	.000100	.000200	.000100	
9,000	36,000	.001550	.000300			
9,250	37,000	.001800	.000250			
9,500	38,000	.002450	.000650			
9,750	39,000	.002950	.000500			
10,000	40,000	.003500	.000550	.002050	.001850	
10,250	41,000	.003850	.000350			
10,500	42,000	.004650	.000800			
10,750	43,000	.005550	.000900			
11,000	44,000	.006350	.000800			
11,250	45,000	.007100	.000750	.005550	.003500	
11,500	46,000	.007950	.000850			
11,750	47,000	.008550	.000600			
12,000	48,000	.009650	.001100			
12,250	49,000	.010350	.000700			
12,500	50,000	.011600	.001250			
13,000	52,000	.013000	.001400			
13,500	54,000	.015500	.002500			
14,000	56,000	.017100	.001600			
14,500	58,000	.019200	.002100			
15,000	60,000	.022100	.002900			
15,500	62,000	.024650	.002550			
16,000	64,000	.028100	.003450			
16,500	66,000	.031200	.003100			
17,000	68,000	.034500	.003300			
17,500	70,000	.038650	.004150			
18,000	72,000	.043600	.004950			
18,500	74,000	.050000	.006400			
19,000	76,000	.058000	.008000			
19,500	78,000	.065500	.007500			
20,000	80,000	.077500	.012000			Micrometer removed.
20,500	82,000	.0975	.0200			
21,000	84,000	.1325	.0350			
21,150	84,600	.1750	.0425			Ultimate strength.
18,400						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	84,600
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.28
Elongation per inch under strain at elastic limit	do....	.001150
Reduction in diameter at point of rupture	do....	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.65 from neck
Character of broken surface		dull spongy; cylindrical surface of bar mottled in vicinity of fracture
Elongation of inch sections		″.15 (″.41 fractured section)

No. 395.

Compression Test.

Marks on bar, I I
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000225	.000225	.000025	.000025	
5,000	10,000	.000450	.000225	.000025	0.	
7,500	15,000	.000550	.000100	.000025	0.	
10,000	20,000	.000725	.000175	.000050	.000025	
12,500	25,000	.000925	.000200	.000150	.000100	
13,000	26,000	.001000	.000075	....	....	
13,500	27,000	.001050	.000050	....	....	Elastic limit.
14,000	28,000	.001125	.000075	....	....	
14,500	29,000	.001225	.000100	....	....	
15,000	30,000	.001350	.000125	.000375	.000225	
15,500	31,000	.001550	.000200	....	....	
16,000	32,000	.002125	.000375	....	....	
16,500	33,000	.002425	.000300	....	....	
17,000	34,000	.002700	.000275	....	....	
17,500	35,000	.003200	.000500	.001900	.001525	
18,000	36,000	.003575	.000375	....	....	
18,500	37,000	.004125	.000550	....	....	Perceptible deflection.
19,000	38,000	.005250	.001125	....	....	
19,500	39,000	.006025	.000775	....	....	
20,000	40,000	.006675	.000650	.005100	.003200	
20,500	41,000	.007375	.000700	....	....	
21,000	42,000	.008125	.000750	....	....	
21,500	43,000	.008975	.000850	....	....	
22,000	44,000	.009700	.000725	....	....	
22,500	45,000	.010450	.000750	.008800	.003700	Test discontinued.

General summary.

Elastic limit per square inch of original section	**pounds..**	**27,000**
Compression per inch under stress at elastic limit	**inch..**	**0.001050**

No. 396.

Compression Test.

Marks on bar, K K
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000275	.000175	0.	....	
7,500	15,000	.000475	.000200	0.	....	
10,000	20,000	.000575	.000100	0.	....	
12,500	25,000	.000800	.000225	0.	....	
13,000	26,000	.000825	.000025	....	....	
13,500	27,000	.000850	.000025	....	....	
14,000	28,000	.000875	.000025	....	....	
14,500	29,000	.000925	.000050	....	....	
15,000	30,000	.000950	.000025	0.	....	
15,500	31,000	.001000	.000050	....	....	
16,000	32,000	.001025	.000025	....	....	
16,500	33,000	.001050	.000025	....	....	
17,000	34,000	.001100	.000050	....	....	
17,500	35,000	.001200	.000100	0.	....	
18,000	36,000	.001250	.000050	....	....	
18,500	37,000	.001275	.000025	....	....	
19,000	38,000	.001300	.000025	....	....	
19,500	39,000	.001325	.000025	....	....	
20,000	40,000	.001425	.000100	0.	....	Elastic limit.
20,500	41,000	.001550	.000125	....	....	
21,000	42,000	.001750	.000200	....	....	
21,500	43,000	.002675	.000925	....	....	Perceptible deflection.
22,000	44,000	.003825	.001150	....	....	
22,500	45,000	.005000	.001175	.003375	.003375	
23,000	46,000	.005275	.000275	....	....	
23,500	47,000	.005950	.000675	....	....	
24,000	48,000	.006700	.000750	....	....	
24,500	49,000	.007500	.000800	....	....	
25,000	50,000	.008750	.001250	.006775	.003400	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	40,000
Compression per inch under stress at elastic limit	inch..	0.001425

The direction of deflection was reversed as the loads were increased from 43,000 pounds per square inch to 50,000 pounds per square inch.

No. 397.

Compression Test.

Marks on bar, M M
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000125	.000125	0.	....	
5,000	10,000	.000300	.000175	0.	....	
7,500	15,000	.000500	.000200	.000050	.000050	
10,000	20,000	.000675	.000175	.000100	.000050	
10,500	21,000	.000675	0.	....	....	
11,000	22,000	.000750	.000075	....	....	
11,500	23,000	.000725	.000025	....	....	
12,000	24,000	.000750	.000025	....	....	
12,500	25,000	.000800	.000050	.000125	.000025	
13,000	26,000	.000875	.000075	....	....	
13,500	27,000	.000900	.000025	....	....	
14,000	28,000	.000950	.000050	....	....	
14,500	29,000	.000950	0.	....	....	
15,000	30,000	.000975	.000025	.000125	0.	Elastic limit.
15,500	31,000	.001075	.000100	....	....	
16,000	32,000	.001225	.000150	....	....	
16,500	33,000	.001450	.000225	....	....	
17,000	34,000	.001750	.000300	....	....	Perceptible deflection.
17,500	35,000	.002000	.000250	.000950	.000825	
18,000	36,000	.002500	.000500	....	....	
18,500	37,000	.002850	.000350	....	....	
19,000	38,000	.003100	.000250	....	....	
19,500	39,000	.003925	.000825	....	....	
20,000	40,000	.004400	.000475	.003000	.002050	
20,500	41,000	.004775	.000375	....	....	
21,000	42,000	.005350	.000575	....	....	
21,500	43,000	.005925	.000575	....	....	
22,000	44,000	.006675	.000750	....	....	
22,500	45,000	.007375	.000700	.005750	.002750	Test discontinued.

General summary.

Elastic limit per square inch of original section ....pounds.. 30,000
Compression per inch under stress at elastic limit..........inch.. 0.000975

There was no appreciable permanent enlargement of the diameter of the bar at one end, along the middle of its length, and at the other end the enlargement in diameter was ″.003.

No. 398.

Compression Test.

Marks on bar, N N
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000150	.000150	0.	....	
5, 000	10, 000	.000275	.000125	0.	....	
7, 500	15, 000	.000450	.000175	0.	....	
10, 000	20, 000	.000625	.000175	.000025	.000025	
12, 500	25, 000	.000775	.000150	.000050	.000025	
13, 000	26, 000	.000775	0.	....	....	
13, 500	27, 000	.000875	.000100	....	....	
14, 000	28, 000	.000925	.000050	....	....	
14, 500	29, 000	.000975	.000050	....	....	Elastic limit.
15, 000	30, 000	.001125	.000150	.000225	.000175	
15, 500	31, 000	.001250	.000125	....	....	
16, 000	32, 000	.001525	.000275	....	....	
16, 500	33, 000	.002100	.000575	....	....	
17, 000	34, 000	.002625	.000525	....	....	Preceptible deflection.
17, 500	35, 000	.003300	.000675	.002225	.002000	
18, 000	36, 000	.003950	.000650	....	....	
18, 500	37, 000	.004650	.000700	....	....	
19, 000	38, 000	.005175	.000525	....	....	
19, 500	39, 000	.005975	.000800	....	....	
20, 000	40, 000	.006700	.000725	.005175	.002950	
20, 500	41, 000	.007250	.000550	....	....	
21, 000	42, 000	.007950	.000700	....	....	
21, 500	43, 000	.008725	.000775	....	....	
22, 000	44, 000	.009475	.000750	....	....	
22, 500	45, 000	.010175	.000700	.008500	.003325	Test discontinued.

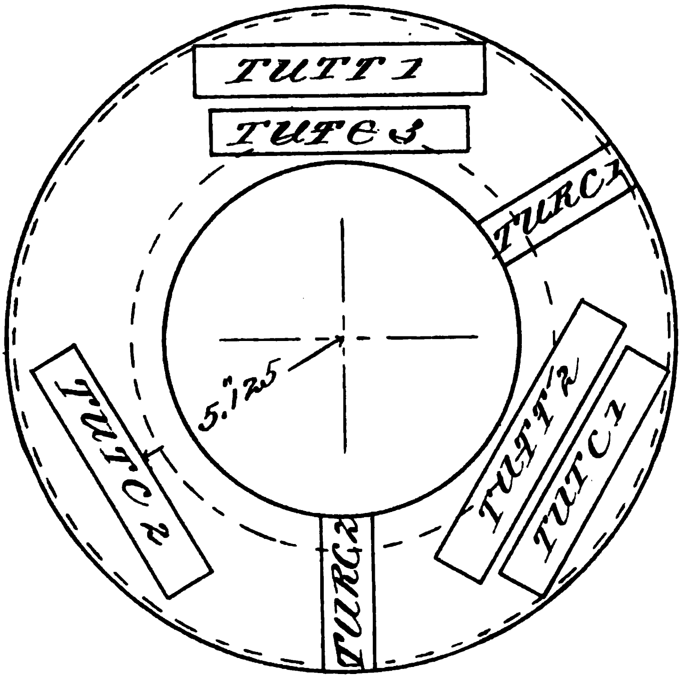
General summary.

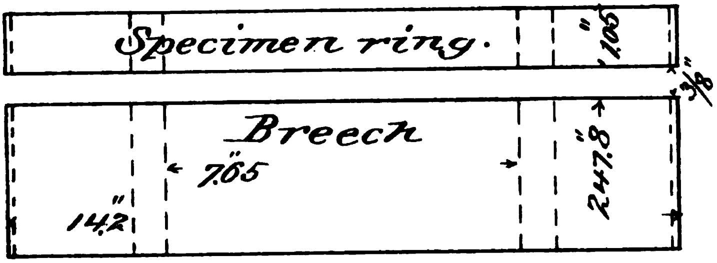
Elastic limit per square inch of original section..pounds.. 29, 000
Compression per inch under stress at elastic limit..inch.. 0.000975

8" Steel B. L. Rifle

2nd Tube

Whitworth manufacture





No. 631.

Marks, T U T T 1
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	0.	....	
2,500	10,000	.000167	.000134	0.	....	
3,750	15,000	.000333	.000166	0.	....	
5,000	20,000	.000500	.000167	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000833	.000166	0.	....	
7,750	31,000	.000867	.000034	....	....	
8,000	32,000	.000900	.000033	....	....	
8,250	33,000	.000967	.000067	....	....	
8,500	34,000	.001000	.000033	....	....	
8,750	35,000	.001033	.000033	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	30,000	.001167	.000034	....	....	
10,000	40,000	.001200	.000033	0.	....	
10,250	41,000	.001267	.000067	....	....	
10,500	42,000	.001333	.000066	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	0.	....	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001533	.000066	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001600	.000033	....	....	
12,500	50,000	.001633	.000033	0.	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001700	.000033	....	....	Elastic limit.
13,250	53,000	.001800	.000100	....	....	
13,500	54,000	.002067	.000867	....	....	
13,750	55,000	.003500	.000833	.001333	.001333	
14,000	56,000	.004033	.000533	....	....	
14,250	57,000	.004867	.000834	....	....	
14,500	58,000	.005667	.000800	....	....	
14,750	59,000	.006333	.000666	....	....	
15,000	60,000	.007167	.000834	.004800	.003467	
15,500	62,000	.009533	.000366	....	....	
16,000	64,000	.010933	.001400	....	....	
16,500	66,000	.013033	.002100	....	....	
17,000	68,000	.014967	.001934	....	....	
17,500	70,000	.017167	.002200	....	....	
18,000	72,000	.019000	.001833	....	....	
18,500	74,000	.021167	.002167	....	....	
19,000	76,000	.023267	.002100	....	....	
19,500	78,000	.026000	.002733	....	....	
20,000	80,000	.028167	.002167	....	....	
20,500	82,000	.031167	.003000	....	....	
21,000	84,000	.033133	.001966	....	....	
21,500	86,000	.037500	.004367	....	....	
22,000	88,000	.040767	.003267	....	....	
22,500	90,000	.044800	.004033	....	....	
23,000	92,000	.0467	.0019	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0633	.0100	....	....	
24,500	98,000	.0733	.0100	....	....	
25,000	100,000	.1033	.0300	....	....	
25,040	100,160	.1233	.0200	....	....	Tensile strength.
22,300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8696
Hardness	20.70
Tensile strength per square inch of original section......pounds..	100,160
Elastic limit per square inch of original section......do....	52,000
Elongation per inch after rupture......inch..	0.1833
Elongation per inch under strain at elastic limit......do....	.001700
Reduction in diameter at point of rupture......do....	.124
Reduction in area after rupture, per centum of original section	30.2
Position of rupture	″.50 from middle of stem
Character of broken surface	fine granular, dull spot reaching from circumference to the center
Elongation of inch sections	″.11, ″.23, ″.21

No. 632.

Marks, T U T T 2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000033	.000033	0.	....	
2, 500	10, 000	.000167	.000134	0.	....	
3, 750	15, 000	.000333	.000166	0.	....	
5, 000	20, 000	.000500	.000167	0.	....	
6, 250	25, 000	.000667	.000167	0.	....	
7, 500	30, 000	.000833	.000166	0.	....	
8, 750	35, 000	.001033	.000200	0.	....	
10, 000	40, 000	.001200	.000167	0.	....	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001267	.000034	....	....	
10, 750	43, 000	.001300	.000033	....	....	
11, 000	44, 000	.001333	.000033	....	....	
11, 250	45, 000	.001367	.000034	0.	....	
11, 500	46, 000	.001433	.000066	....	....	
11, 750	47, 000	.001467	.000034	....	....	
12, 000	48, 000	.001500	.000033	....	....	
12, 250	49, 000	.001533	.000033	....	....	
12, 500	50, 000	.001567	.000034	0.	....	
12, 750	51, 000	.001633	.000066	....	....	Elastic limit.
13, 000	52, 000	.001833	.000200	....	....	
13, 250	53, 000	.002167	.000334	....	....	
13, 500	54, 000	.002700	.000533	....	....	
13, 750	55, 000	.003133	.000433	.001233	.001233	
14, 000	56, 000	.004000	.000867	....	....	
14, 250	57, 000	.004500	.000500	....	....	
14, 500	58, 000	.005567	.001067	....	....	
14, 750	59, 000	.007133	.001566	....	....	
15, 000	60, 000	.008200	.001067	.005033	.003800	
15, 500	62, 000	.008667	.000467	....	....	
16, 000	64, 000	.010500	.001833	....	....	
16, 500	66, 000	.012833	.002333	....	....	
17, 000	68, 000	.014433	.001600	....	....	
17, 500	70, 000	.016767	.002334	....	....	
18, 000	72, 000	.018300	.001533	....	....	
18, 500	74, 000	.020933	.002633	....	....	
19, 000	76, 000	.023167	.002234	....	....	
19, 500	78, 000	.027500	.004333	....	....	
20, 000	80, 000	.032000	.004500	....	....	
20, 500	82, 000	.0350	.0030	....	....	
21, 000	84, 000	.0383	.0033	....	....	
21, 500	86, 000	.0400	.0017	....	....	
22, 000	88, 000	.0433	.0033	....	....	
22, 500	90, 000	.0467	.0034	....	....	
23, 000	92, 000	.0533	.0066	....	....	
23, 500	94, 000	.0667	.0134	....	....	
24, 000	96, 000	.0833	.0166	....	....	
24, 850	97, 400	.1133	.0300	....	....	Tensile strength.
21, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	97, 400
Elastic limit per square inch of original section	do	51, 000
Elongation per inch after rupture	inch	0.1738
Elongation per inch under strain at elastic limit	do	.001633
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.75 from neck
Character of broken surface		fine granular, dull spot reaching from the circumference to the center
Elongation of inch sections		″.07, ″.11, ″.34

No. 499.

Marks, T U T C 1
Length, 5''.
Diameter, ''.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000133	.000133	0.	....	
5,000	10,000	.000333	.000200	0.	....	
7,500	15,000	.000467	.000134	0.	....	
10,000	20,000	.000633	.000166	0.	....	
12,500	25,000	.000800	.000167	0.	....	
15,000	30,000	.000967	.000167	0.	....	
17,500	35,000	.001100	.000133	0.	....	
20,000	40,000	.001200	.000100	0.	....	
20,500	41,000	.001267	.000067	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001367	.000034	....	....	
22,500	45,000	.001400	.000033	0.	....	
23,000	46,000	.001433	.000033	....	....	
23,500	47,000	.001467	.000034	....	....	
24,000	48,000	.001500	.000033	....	....	
24,500	49,000	.001533	.000033	....	....	
25,000	50,000	.001567	.000034	0.	....	
25,500	51,000	.001600	.000033	....	....	
26,000	52,000	.001667	.000067	....	....	
26,500	53,000	.001700	.000033	....	....	Elastic limit.
27,000	54,000	.001867	.000167	....	....	
27,500	55,000	.002433	.000566	.000633	.000633	
28,000	56,000	.003267	.000834	....	....	
28,500	57,000	.004233	.000966	....	....	
29,000	58,000	.005067	.000834	....	....	
29,500	59,000	.006000	.000933	....	....	
30,000	60,000	.006800	.000800	.004600	.003967	
45,380	90,760	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section..........pounds..	53,000
Compression per inch under stress at elastic limit..........inch..	0.001700
Ultimate strength per square inch of original section..........pounds..	90,760
Manner of failure..........	triple flexure

No. 500.

Marks, T U T C 2
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000100	.000100	0.	....	
5, 000	10, 000	.000267	.000167	0.	....	
7, 500	15, 000	.000433	.000166	0.	....	
10, 000	20, 000	.000600	.000167	0.	....	
12, 500	25, 000	.000767	.000167	0.	....	
15, 000	30, 000	.000933	.000166	0.	....	
17, 500	35, 000	.001100	.000167	.000033	.000033	
20, 000	40, 000	.001233	.000133	.000033	0.	
20, 500	41, 000	.001267	.000034	....	....	
21, 000	42, 000	.001300	.000033	....	....	
21, 500	43, 000	.001333	.000033	....	....	
22, 000	44, 000	.001367	.000034	....	....	
22, 500	45, 000	.001400	.000033	.000067	.000034	
23, 000	46, 000	.001433	.000033	....	....	
23, 500	47, 000	.001467	.000034	....	....	
24, 000	48, 000	.001500	.000033	....	....	
24, 500	49, 000	.001533	.000033	....	....	
25, 000	50, 000	.001567	.000034	.000100	.000033	
25, 500	51, 000	.001600	.000033	....	....	
26, 000	52, 000	.001633	.000033	....	....	
26, 500	53, 000	.001700	.000067	....	....	Elastic limit.
27, 000	54, 000	.001867	.000167	....	....	
27, 500	55, 000	.002267	.000400	.000633	.000533	
28, 000	56, 000	.003033	.000766	....	....	
28, 500	57, 000	.003833	.000800	....	....	
29, 000	58, 000	.004667	.000834	....	....	
29, 500	59, 000	.005333	.000666	....	....	
30, 000	60, 000	.006167	.000834	.004067	.003484	
48, 410	96, 820	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section ....pounds.. 53, 000
Compression per inch under stress at elastic limit..inch.. 0. 001700
Ultimate strength per square inch of original section ....pounds.. 96, 820
Manner of failure .... triple flexure

No. 501.

Marks, T U T C 3
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000200	.000200	0.	....	
5,000	10,000	.000400	.000200	0.	....	
7,500	15,000	.000567	.000167	0.	....	
10,000	20,000	.000732	.000166	0.	....	
12,500	25,000	.000900	.000167	0.	....	
15,000	30,000	.001067	.000167	0.	....	
17,500	35,000	.001233	.000166	0.	....	
20,000	40,000	.001367	.000134	0.	....	
20,500	41,000	.001400	.000033	....	....	
21,000	42,000	.001433	.000033	....	....	
21,500	43,000	.001500	.000067	....	....	
22,000	44,000	.001500	0.	....	....	
22,500	45,000	.001533	.000033	0.	....	
23,000	46,000	.001567	.000034	....	....	
23,500	47,000	.001600	.000033	....	....	
24,000	48,000	.001667	.000067	....	....	
24,500	49,000	.001667	0.	....	....	
25,000	50,000	.001700	.000033	0.	....	
25,500	51,000	.001800	.000100	....	....	
26,000	52,000	.001833	.000033	....	....	Elastic limit.
26,500	53,000	.001033	.000100	....	....	
27,000	54,000	.002167	.000234	....	....	
27,500	55,000	.002600	.000433	.000700	.000700	
28,000	56,000	.002933	.000333	....	....	
28,500	57,000	.003300	.000367	....	....	
29,000	58,000	.003833	.000533	....	....	
29,500	59,000	.004400	.000567	....	....	
30,000	60,000	.005167	.000767	.003100	.002400	
45,780	91,560	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	52,000
Compression per inch under stress at elastic limit	inch..	0.001833
Ultimate strength per square inch of original section	pounds..	91,560
Manner of failure		triple flexure

No. 502.

Crushing Specimens.

Marks, T U R C 1
Length, 3″.
Diameter, ″.797.
Sectional area, .50 square inch.

Maximum load applied, 75,000 pounds, equal to 150,000 pounds per square inch. Specimen deflected at middle and shortened to 2″.12.

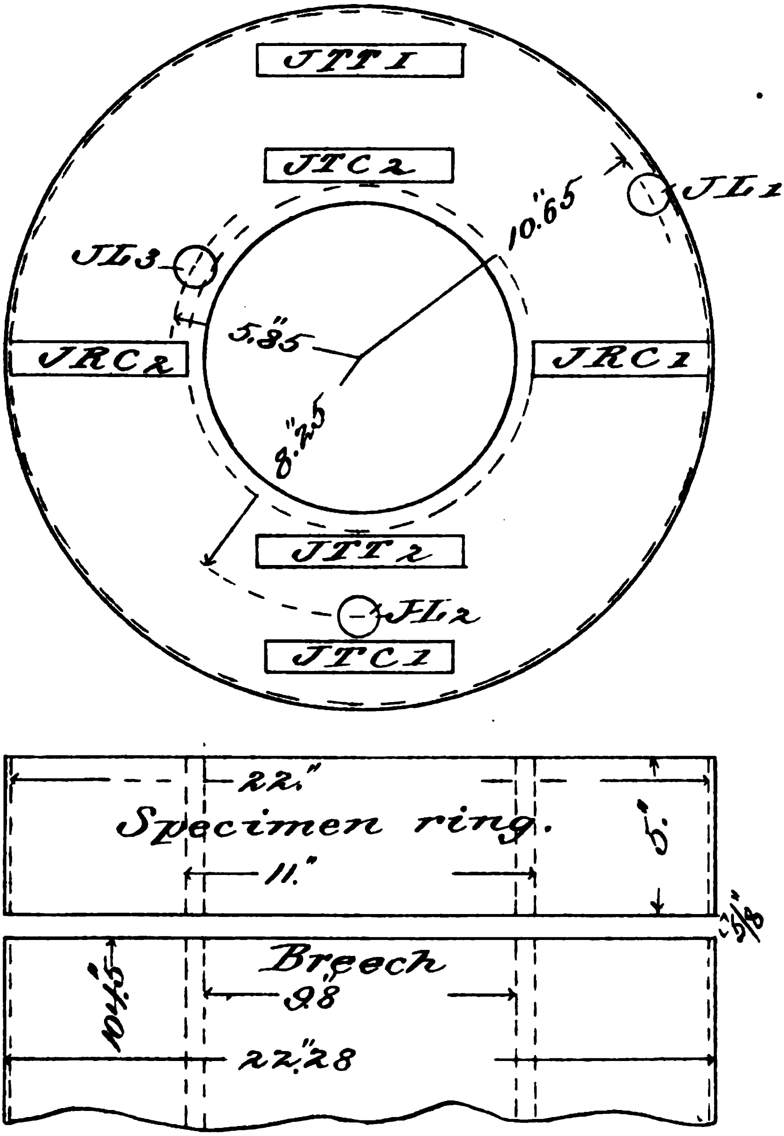
No. 503.

Marks, T U R C 2
Length, 3″.
Diameter, ″.797.
Sectional area, .50 square inch.

Maximum load applied, 75,000 pounds, equal to 150,000 pounds per square inch. Specimen deflected at middle and shortened to 1″.81.

8" Steel B.L. Rifle.
2nd Jacket

Whitworth manufacture.



No. 640.

Marks, J L 2
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000050	.000050	0.	....	
2, 500	10, 000	.000200	.000150	0.	....	
3, 750	15, 000	.000400	.000200	0.	....	
5, 000	20, 000	.000600	.000200	0.	....	
6, 250	25, 000	.000700	.000100	0.	....	
7, 500	30, 000	.000950	.000250	0.	....	
8, 750	35, 000	.001100	.000150	0.	....	
10, 000	40, 000	.001250	.000150	0.	....	
10, 250	41, 000	.001300	.000050	....	....	
10, 500	42, 000	.001350	.000050	....	....	
10, 750	43, 000	.001400	.000050	....	....	
11, 000	44, 000	.001450	.000050	....	....	
11, 250	45, 000	.001450	0.	0.	....	
11, 500	46, 000	.001500	.000050	....	....	
11, 750	47, 000	.001550	.000050	....	....	
12, 000	48, 000	.001550	0.	....	....	Elastic limit.
12, 250	49, 000	.011150	.009600	....	....	
12, 500	50, 000	.011850	.000700	.009700	.009700	
12, 750	51, 000	.012800	.000950	....	....	
13, 000	52, 000	.013650	.000850	....	....	
13, 250	53, 000	.014350	.000700	....	....	
13, 500	54, 000	.015600	.001250	....	....	
13, 750	55, 000	.017050	.001450	.014500	.004800	
14, 000	56, 000	.017900	.000850	....	....	
14, 250	57, 000	.018350	.000450	....	....	
14, 500	58, 000	.019600	.001250	....	....	
14, 750	59, 000	.020900	.001300	....	....	
15, 000	60, 000	.022850	.001950	.020100	.005600	
15, 500	62, 000	.025850	.003000	....	....	
16, 000	64, 000	.029000	.003150	....	....	
16, 500	66, 000	.030950	.001950	....	....	
17, 000	68, 000	.034500	.003550	....	....	
17, 500	70, 000	.038250	.003750	....	....	
18, 000	72, 000	.043200	.004950	....	....	
18, 500	74, 000	.048100	.004900	....	....	
19, 000	76, 000	.054650	.006550	....	....	
19, 500	78, 000	.063900	.009250	....	....	
20, 000	80, 000	.074250	.010350	....	....	
20, 500	82, 000	.086000	.011750	....	....	
21, 000	84, 000	.1100	.0240	....	....	
21, 870	85, 480	.1400	.0300	....	....	Tensile strength.
17, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8641
Hardness		14.06
Tensile strength per square inch of original section	pounds..	85, 480
Elastic limit per square inch of original section	do...	48, 000
Elongation per inch after rupture	inch..	0.2950
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.9 from neck
Character of broken surface		fine, silky; cup-shaped ends
Elongation of inch sections		″.42*, ″.17

No. 641.

Marks, J L 3
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000050	.000050	0.	....	
2,500	10,000	.000200	.000150	0.	....	
3,750	15,000	.000350	.000150	0.	....	
5,000	20,000	.000550	.000200	0.	....	
6,250	25,000	.000650	.000100	0.	....	
7,500	30,000	.000950	.000300	0.	....	
8,750	35,000	.001100	.000150	0.	....	
10,000	40,000	.001250	.000150	0.	....	
10,250	41,000	.001300	.000050	....	....	
10,500	42,000	.001350	.000050	....	....	
10,750	43,000	.001400	.000050	....	....	
11,000	44,000	.001450	.000050	....	....	
11,250	45,000	.001450	0.	0.	....	
11,500	46,000	.001500	.000050	....	....	
11,750	47,000	.001500	0.	....	....	
12,000	48,000	.001550	.000050	....	....	
12,250	49,000	.001600	.000050	....	....	
12,500	50,000	.001600	0.	0.	....	Elastic limit.
12,730	51,000	.007300	.005700	....	....	
13,000	52,000	.007800	.000500	....	....	
13,250	53,000	.008550	.000750	....	....	
13,500	54,000	.009200	.000650	....	....	
13,750	55,000	.010250	.001050	.008050	.008050	
14,000	56,000	.011150	.000900	....	....	
14,250	57,000	.011650	.000500	....	....	
14,500	58,000	.012650	.001000	....	....	
14,750	59,000	.013550	.000900	....	....	
15,000	60,000	.014550	.001000	.012150	.004100	
15,500	62,000	.016650	.002100	....	....	
16,000	64,000	.019250	.002600	....	....	
16,500	66,000	.020650	.001400	....	....	
17,000	68,000	.024250	.003600	....	....	
17,500	70,000	.026250	.002000	....	....	
18,000	72,000	.029500	.003250	....	....	
18,500	74,000	.032900	.003400	....	....	
19,000	76,000	.036500	.003600	....	....	
19,500	78,000	.040400	.003900	....	....	
20,000	80,000	.045500	.005100	....	....	
20,500	82,000	.051750	.006250	....	....	
21,000	84,000	.060750	.009000	....	....	
21,500	86,000	.070250	.009500	....	....	
22,000	88,000	.090000	.009750	....	....	
22,490	89,960	.1450	.0550	....	....	Tensile strength.
18,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..............................pounds.. 89,960
Elastic limit per square inch of original section..............................do.... 50,000
Elongation per inch after rupture..............................inch.. 0.2750
Elongation per inch under strain at elastic limit..............................do.... .001600
Reduction in diameter at point of rupture..............................do.... .184
Reduction in area after rupture, per centum of original section.............................. 54.6
Position of rupture.............................. ″.25 from middle of stem
Character of broken surface..............................fine silky; cup-shaped end
Elongation of inch sections.............................. ″.39*, ″.16

No. 505.

Marks, J T C 1
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000200	.000200	0.	....	
5, 000	10, 000	.000367	.000167	0.	....	
7, 500	15, 000	.000500	.000133	0.	....	
10, 000	20, 000	.000667	.000167	0.	....	
12, 500	25, 000	.000833	.000166	.000033	.000033	
15, 000	30, 000	.001000	.000167	.000033	0.	
17, 500	35, 000	.001133	.000133	.000033	0.	
20, 000	40, 000	.001300	.000167	.000033	0.	
20, 500	41, 000	.001300	0.	....	....	
21, 000	42, 000	.001333	.000033	....	....	
21, 500	43, 000	.001367	.000034	....	....	
22, 000	44, 000	.001400	.000036	....	....	
22, 500	45, 000	.001433	.000033	.000033	0.	
23, 000	46, 000	.001467	.000034	....	....	
23, 500	47, 000	.001500	.000033	....	....	
24, 000	48, 000	.001533	.000033	....	....	
24, 500	49, 000	.001567	.000034	....	....	
25, 000	50, 000	.001600	.000033	.000067	.000034	
25, 500	51, 000	.001633	.000033	....	....	
26, 000	52, 000	.001667	.000034	....	....	
26, 500	53, 000	.001700	.000033	....	....	
27, 000	54, 000	.001733	.000033	....	....	
27, 500	55, 000	.001767	.000034	.000100	.000033	
28, 000	56, 000	.001767	0.	....	....	Elastic limit.
28, 500	57, 000	.008167	.006400	....	....	
29, 000	58, 000	.008667	.000500	....	....	
29, 500	59, 000	.009067	.000400	....	....	
30, 000	60, 000	.009600	.000533	.007467	.007367	
43, 640	87, 280	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	56, 000
Compression per inch under stress at elastic limit	inch..	0. 001767
Ultimate strength per square inch of original section	pounds..	87, 280
Manner of failure		triple flexure

No. 506.

Marks, J T C 2
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000167	.000167	0.	....	
5, 000	10, 000	.000367	.000200	0.	....	
7, 500	15, 000	.000533	.000166	0.	....	
10, 000	20, 000	.000667	.000134	0.	....	
12, 500	25, 000	.000833	.000166	0.	....	
15, 000	30, 000	.001033	.000200	.000033	.000033	
17, 500	35, 000	.001200	.000167	.000033	0.	
20, 000	40, 000	.061367	.000167	.000100	.000067	
20, 500	41, 000	.001367	0.	....	....	
21, 000	42, 000	.001433	.000066	....	....	
21, 500	43, 000	.001500	.000067	....	....	
22, 000	44, 000	.001500	0.	....	....	
22, 500	45, 000	.001567	.000067	.000167	.000067	Elastic limit.
23, 000	46, 000	.001667 .002500	.000100 .000833	....	....	
23, 500	47, 000	.003667	.001167	....	....	
24, 000	48, 000	.005333	.001606	....	....	
24, 500	49, 000	.006867	.001534	....	....	
25, 000	50, 000	.007433	.000566	.005567	.005400	
25, 500	51, 000	.008033	.000600	....	....	
26, 000	52, 000	.008600	.000567	....	....	
26, 500	53, 000	.009200	.000600	....	....	
27, 000	54, 000	.009933	.000733	....	....	
27, 500	55, 000	.010500	.000567	.008367	.002800	
39, 500	79, 000	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section ....pounds.. 45, 000
Compression per inch under stress at elastic limit ....inch.. 0. 001567
Ultimate strength per square inch of original section..pounds.. 79, 000
Manner of failure.. triple flexure

No. 507.

Marks, J R C 1
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000200	.000200	0.	....	
5,000	10,000	.000367	.000167	0.	....	
7,500	15,000	.000533	.000166	.000033	.000033	
10,000	20,000	.000700	.000167	.000033	0.	
12,500	25,000	.000867	.000167	.000033	0.	
15,000	30,000	.001033	.000166	.000067	.000034	
17,500	35,000	.001200	.000167	.000067	0.	
20,000	40,000	.001333	.000133	.000100	.000033	
20,500	41,000	.001367	.000034	....	....	
21,000	42,000	.001400	.000033	....	....	
21,500	43,000	.001433	.000033	....	....	
22,000	44,000	.001467	.000034	....	....	
22,500	45,000	.001500	.000033	.000100	0.	
23,000	46,000	.001533	.000033	....	....	
23,500	47,000	.001567	.000034	....	....	
24,000	48,000	.001600	.000033	....	....	
24,500	49,000	.001633	.000033	....	....	Elastic limit.
25,000	50,000	.007533	.005900	.005833	.005733	
25,500	51,000	.008667	.001134	....	....	
26,000	52,000	.009000	.000333	....	....	
26,500	53,000	.009600	.000600	....	....	
27,000	54,000	.010433	.000833	....	....	
27,500	55,000	.011300	.000867	....	....	
44,320	88,640	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section .... pounds..	49,000
Compression per inch under stress at elastic limit .... inch..	0.001633
Ultimate strength per square inch of original section .... pounds..	88,640
Manner of failure	triple flexure

No. 508.

Marks, J R C 2
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

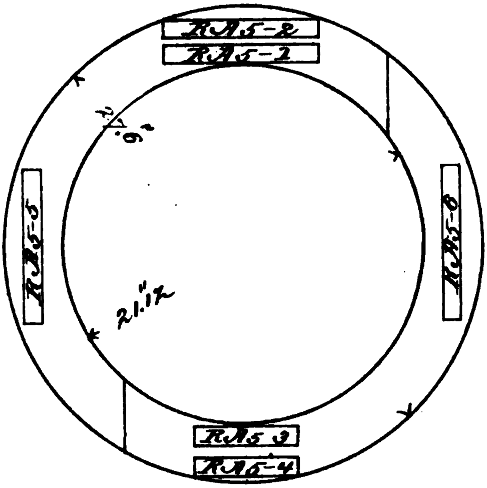
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000133	.000133	0.	....	
5,000	10,000	.000300	.000167	0.	....	
7,500	15,000	.000467	.000167	0.	....	
10,000	20,000	.000633	.000166	0.	....	
12,500	25,000	.000800	.000167	0.	....	
15,000	30,000	.000933	.000133	0.	....	
17,500	35,000	.001100	.000167	.000033	.000033	
20,000	40,000	.001267	.000167	.000033	0.	
20,500	41,000	.001267	0.	....	....	
21,000	42,000	.001300	.000033	....	....	
21,500	43,000	.001333	.000033	....	....	
22,000	44,000	.001400	.000067	....	....	
22,500	45,000	.001433	.000033	.000033	0.	Elastic limit.
23,000	46,000	.005533	.004100	....	....	
23,500	47,000	.005867	.000334	....	....	
24,000	48,000	.006500	.000633	....	....	
24,500	49,000	.006933	.000433	....	....	
25,000	50,000	.007600	.000667	.005833	.005800	
25,500	51,000	.008167	.000567	....	....	
26,000	52,000	.008833	.000666	....	....	
26,500	53,000	.009833	.001000	....	....	
27,000	54,000	.010800	.000967	....	....	
27,500	55,000	.011500	.000700	.009467	.003634	
40,760	81,520	....	....	....	....	Ultimate strength.

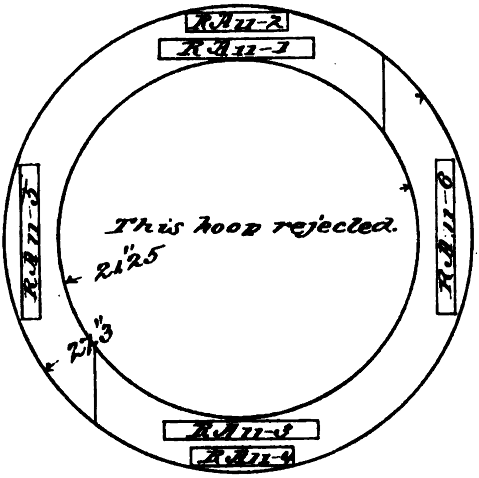
General summary.

Elastic limit per square inch of original section	pounds..	45,000
Compression per inch under stress at elastic limit	inch..	0.001433
Ultimate strength per square inch of original section	pounds..	81,520
Manner of failure		triple flexure

8" Steel B. L. Rifle

Hoops A5 and A11





No. 335.

Tension Test.

Marks on bar, $\overset{\text{R A}_3}{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000400	.000150	0.	....	
5,000	20,000	.000550	.000150	.000016	.000016	
6,250	25,000	.000683	.000133	.000016	0.	
7,500	30,000	.000850	.000167	.000016	0.	
8,750	35,000	.001016	.000166	.000033	.000017	
10,000	40,000	.001183	.000167	.000033	0.	
10,250	41,000	.001216	.000033	....	....	
10,500	42,000	.001233	.000017	....	....	
10,750	43,000	.001250	.000017	....	....	
11,000	44,000	.001266	.000016	....	....	
11,250	45,000	.001300	.000034	.000050	.000017	
11,500	46,000	.001350	.000050	....	....	
11,750	47,000	.001383	.000033	....	....	
12,000	48,000	.001416	.000033	....	....	Elastic limit.
12,250	49,000	.004066	.000650	....	....	
12,500	50,000	.004816	.000750	.003183	.003133	
12,750	51,000	.005283	.000467	....	....	
13,000	52,000	.006250	.000967	....	....	
13,250	53,000	.006866	.000616	....	....	
13,500	54,000	.008300	.001434	....	....	
13,750	55,000	.008933	.000633	.007083	.003900	
14,000	56,000	.011016	.002083	....	....	
14,250	57,000	.011766	.000750	....	....	
14,500	58,000	.012933	.001167	....	....	
14,750	59,000	.013800	.000867	....	....	
15,000	60,000	.015266	.001466	.012966	.005883	
15,250	61,000	.015933	.000667	....	....	
15,500	62,000	.017433	.001500	....	....	
15,750	63,000	.018266	.000833	....	....	
16,000	64,000	.019783	.001517	....	....	
16,250	65,000	.021250	.001467	.018650	.005684	
16,500	66,000	.022416	.001166	....	....	
16,750	67,000	.023933	.001517	....	....	
17,000	68,000	.025433	.001500	....	....	
17,250	69,000	.026250	.000817	....	....	
17,500	70,000	.028433	.002183	.025600	.006950	
18,000	72,000	.031916	.003483	....	....	
18,500	74,000	.035933	.004017	....	....	
19,000	76,000	.040733	.004800	....	....	
19,500	78,000	.046350	.005617	....	....	Micrometer removed.
20,000	80,000	.0483	.001950	....	....	
20,500	82,000	.0600	.0117	....	....	
21,000	84,000	.0700	.0100	....	....	
21,480	85,920	.0950	.0250	....	....	Ultimate strength.
17,950	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8527
Hardness	14.69
Tensile strength per square inch of original section ..... pounds..	85,920
Elastic limit per square inch of original section ..... do....	48,000
Elongation per inch after rupture ..... inch..	0.1883
Elongation per inch under strain at elastic limit ..... do....	.001416
Reduction in diameter at point of rupture ..... do....	.184
Reduction in area after rupture, per centum of original section	54.6
Position of rupture	″.75 from neck
Character of broken surface	silky, interspersed with fine granulation
Elongation of inch sections	″.05, ″.07, ″.07, ″.09, ″.12 (″.48 fractured section)

No. 336.

Tension Test.

Marks on bar, $^{B}{}_{2}{}^{A_{8}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000166	.000083	0.	....	
3,750	15,000	.000316	.000150	0.	....	
5,000	20,000	.000483	.000167	0.	....	
6,250	25,000	.000650	.000167	0.	....	
7,500	30,000	.000816	.000166	0.	....	
8,750	35,000	.000983	.000167	0.	....	
10,000	40,000	.001150	.000167	0.	....	
10,250	41,000	.001200	.000050	....	....	
10,500	42,000	.001216	.000016	....	....	
10,750	43,000	.001233	.000017	....	....	
11,000	44,000	.001266	.000033	....	....	
11,250	45,000	.001300	.000034	0.	....	
11,500	46,000	.001366	.000066	....	....	
11,750	47,000	.001383	.000017	....	....	
12,000	48,000	.001400	.000017	....	....	
12,250	49,000	.001416	.000016	....	....	
12,500	50,000	.001450	.000034	0.	....	
12,750	51,000	.001533	.000083	....	....	Elastic limit.
13,000	52,000	.001950	.000417	....	....	
13,250	53,000	.002250	.000300	....	....	
13,500	54,000	.002583	.000333	....	....	
13,750	55,000	.002866	.000283	.001116	.001116	
14,000	56,000	.003500	.000634	....	....	
14,250	57,000	.005250	.001750	....	....	
14,500	58,000	.007583	.002333	....	....	
14,750	59,000	.008666	.001083	....	....	
15,000	60,000	.009916	.001250	.007633	.006517	
15,250	61,000	.010583	.000667	....	....	
15,500	62,000	.011333	.000750	....	....	
15,750	63,000	.012166	.000833	....	....	
16,000	64,000	.013666	.001500	....	....	
16,250	65,000	.014666	.001000	.012333	.004700	
16,500	66,000	.015666	.001000	....	....	
16,750	67,000	.016666	.001000	....	....	
17,000	68,000	.018000	.001334	....	....	
17,250	69,000	.019333	.001333	....	....	
17,500	70,000	.021000	.001667	.018166	.005833	
18,000	72,000	.023583	.002583	....	....	
18,500	74,000	.027266	.003683	....	....	
19,000	76,000	.030000	.002734	....	....	
19,500	78,000	.033833	.003833	....	....	
20,000	80,000	.039083	.005250	....	....	Micrometer removed.
20,500	82,000	.0417	.002617	....	....	
21,000	84,000	.0483	.0066	....	....	
21,500	86,000	.0567	.0084	....	....	
22,000	88,000	.0683	.0116	....	....	
22,500	90,000	.0900	.0217	....	....	
22,560	90,240	.1033	.0133	....	....	Ultimate strength.
18,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	90,240
Elastic limit per square inch of original section	do ...	51,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.001533
Reduction in diameter at point of rupture	do....	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		″.55 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.09, ″.07, ″.08, ″.08, ″.10 (″.39 fractured section)

No. 345.

Tension Test.

Marks on bar, $^{\text{R A}}_{8}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000066	.000066	0.	....	
2, 500	10, 000	.000200	.000134	0.	....	
3, 750	15, 000	.000366	.000166	0.	....	
5, 000	20, 000	.000533	.000167	0.	....	
6, 250	25, 000	.000700	.000167	.000033	.000033	
7, 500	30, 000	.000800	.000100	.000033	0.	
8, 750	35, 000	.001000	.000200	.000033	0.	
10, 000	40, 000	.001133	.000133	.000033	0.	
10, 250	41, 000	.001166	.000033	....	....	
10, 500	42, 000	.001200	.000034	....	....	
10, 750	43, 000	.001233	.000033	....	....	
11, 000	44, 000	.001266	.000033	....	....	
11, 250	45, 000	.001300	.000034	.000033	0.	
11, 500	46, 000	.001333	.000033	....	....	
11, 750	47, 000	.001366	.000033	....	....	
12, 000	48, 000	.001400	.000034	....	....	
12, 250	49, 000	.001433	.000033	....	....	
12, 500	50, 000	.001466	.000033	.000033	0.	
12, 750	51, 000	.001500	.000034	....	....	
13, 000	52, 000	.001533	.000033	....	....	
13, 250	53, 000	.001566	.000033	....	....	
13, 500	54, 000	.001600	.000034	....	....	
13, 750	55, 000	.001633	.000033	.000033	0.	
14, 000	56, 000	.001666	.000033	....	....	
14, 250	57, 000	.001766	.000100	....	....	
14, 500	58, 000	.001800	.000034	....	....	
14, 750	59, 000	.001833	.000033	....	....	
15, 000	60, 000	.001866	.000033	.000066	.000033	Elastic limit.
15, 250	61, 000	.001933	.000067	....	....	
15, 500	62, 000	.002066	.000133	....	....	
15, 750	63, 000	.002433	.000367	....	....	
16, 000	64, 000	.003666	.001233	....	....	
16, 250	65, 000	.004900	.001234	.002633	.002567	Rested under initial load, one hour.
16, 500	66, 000	.006266	.001366	....	....	
16, 750	67, 000	.007400	.001134	....	....	
17, 000	68, 000	.008600	.001200	....	....	
17, 250	69, 000	.009666	.001066	....	....	
17, 500	70, 000	.011166	.001500	.008466	.005833	
18, 000	72, 000	.012300	.001134	....	....	
18, 500	74, 000	.014933	.002633	....	....	
19, 000	76, 000	.017300	.002367	....	....	
19, 500	78, 000	.019733	.002433	....	....	
20, 000	80, 000	.022300	.002567	....	....	
20, 500	82, 000	.024833	.002533	....	....	
21, 000	84, 000	.028433	.003600	....	....	
21, 500	86, 000	.031100	.002667	....	....	
22, 000	88, 000	.034433	.003333	....	....	
22, 500	90, 000	.039166	.004733	....	....	
23, 000	92, 000	.045900	.006734	....	....	
23, 500	94, 000	.053066	.007166	....	....	Micrometer removed.
24, 000	96, 000	.0600	.006934	....	....	
24, 500	98, 000	.0800	.0200	....	....	
24, 730	98, 920	.1100	.0300	....	....	Ultimate strength.
20, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	98, 920
Elastic limit per square inch of original section	do....	60, 000
Elongation per inch after rupture	inch..	0. 20
Elongation per inch under strain at elastic limit	do....	.001866
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		″.75 from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″,10, ″,13 (″.37 fractured section)

No. 346.

Tension Test.

Marks on bar, $^{\text{B A}_4}_{4}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000366	.000133	0.	....	
5,000	20,000	.000533	.000167	.000033	.000033	
6,250	25,000	.000666	.000133	.000033	0.	
7,500	30,000	.000866	.000200	.000033	0.	
8,750	35,000	.001000	.000134	.000033	0.	
10,000	40,000	.001133	.000133	.000033	0.	
10,250	41,000	.001166	.000033	....	....	
10,500	42,000	.001200	.000034	....	....	
10,750	43,000	.001233	.000033	....	....	
11,000	44,000	.001266	.000033	....	....	
11,250	45,000	.001300	.000034	.000033	0.	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001366	.000033	....	....	
12,000	48,000	.001400	.000034	....	....	
12,250	49,000	.001433	.000033	....	....	
12,500	50,000	.001433	0.	.000066	.000033	
12,750	51,000	.001466	.000033	....	....	
13,000	52,000	.001500	.000034	....	....	
13,250	53,000	.001533	.000033	....	....	
13,500	54,000	.001600	.000067	....	....	
13,750	55,000	.001633	.000033	.000066	0.	
14,000	56,000	.001666	.000033	....	....	
14,250	57,000	.001700	.000034	....	....	
14,500	58,000	.001733	.000033	....	....	
14,750	59,000	.001766	.000033	....	....	
15,000	60,000	.001866	.000100	.000100	.000034	Elastic limit.
15,250	61,000	.001966	.000100	....	....	
15,500	62,000	.002533	.000567	....	....	
15,750	63,000	.003366	.000833	....	....	
16,000	64,000	.004233	.000867	....	....	
16,250	65,000	.005833	.001600	.003600	.003500	
16,500	66,000	.006600	.000767	....	....	
16,750	67,000	.007433	.000833	....	....	
17,000	68,000	.008466	.001033	....	....	
17,250	69,000	.009733	.001267	....	....	
17,500	70,000	.010933	.001200	.008266	.004666	
18,000	72,000	.012166	.001233	....	....	
18,500	74,000	.014566	.002400	....	....	
19,000	76,000	.017000	.002434	....	....	
19,500	78,000	.019766	.002766	....	....	
20,000	80,000	.021833	.002067	....	....	
20,500	82,000	.024033	.002200	....	....	
21,000	84,000	.026966	.002933	....	....	
21,500	86,000	.029966	.003000	....	....	
22,000	88,000	.033700	.003734	....	....	
22,500	90,000	.038266	.004566	....	....	Micrometer removed.
23,000	92,000	.0400	.001734	....	....	
23,500	94,000	.0467	.0067	....	....	
24,000	96,000	.0533	.0066	....	....	
24,500	98,000	.0633	.0100	....	....	
25,000	100,000	.0933	.0300	....	....	
25,100	100,400	.1233	.0300	....	....	Ultimate strength.
21,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,400
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.176
Elongation per inch under strain at elastic limit	do....	.001866
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".70 from neck
Character of broken surface		fine, granular, radiating from a dull center
Elongation of inch sections		".00, ".11, (".33 fractured section)

No. 402.

Tension Test.

Mark on bar, $\frac{RA_3}{5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	.000017	.000017	
3,750	15,000	.000467	.000167	.000017	0.	
5,000	20,000	.000633	.000166	.000017	0.	
6,250	25,000	.000750	.000117	.000033	.000016	
7,500	30,000	.000900	.000150	.000033	0.	
8,750	35,000	.001083	.000183	.000033	0.	
10,000	40,000	.001250	.000167	.000033	0.	
10,250	41,000	.001300	.000050	....	....	
10,500	42,000	.001317	.000017	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001417	.000050	.000033	0.	
11,500	46,000	.001467	.000050	....	....	
11,750	47,000	.001483	.000016	....	....	
12,000	48,000	.001550	.000067	....	....	
12,250	49,000	.001567	.000017	....	....	
12,500	50,000	.001600	.000033	.000033	0.	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001783	.000050	.000050	.000017	
14,000	56,000	.001817	.000034	....	....	
14,250	57,000	.001850	.000033	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001917	.000034	....	....	
15,000	60,000	.001967	.000050	.000083	.000033	
15,250	61,000	.002033	.000066	....	....	
15,500	62,000	.002067	.000034	....	....	
15,750	63,000	.002117	.000050	....	....	Elastic limit.
16,000	64,000	.002233	.000116	....	....	
16,250	65,000	.002433	.000200	.000333	.000250	
16,500	66,000	.002700	.000267	....	....	
16,750	67,000	.003200	.000500	....	....	
17,000	68,000	.004367	.001167	....	....	
17,250	69,000	.005417	.001050	....	....	
17,500	70,000	.006650	.001233	.004133	.003800	
18,000	72,000	.008050	.001400	....	....	
18,500	74,000	.010367	.002317	....	....	
19,000	76,000	.012167	.001800	....	....	
19,500	78,000	.014283	.002116	....	....	
20,000	80,000	.016533	.002250	....	....	
20,500	82,000	.017833	.001300	....	....	
21,000	84,000	.020667	.002834	....	....	
21,500	86,000	.022417	.001750	....	....	
22,000	88,000	.025167	.002750	....	....	
22,500	90,000	.028383	.003216	....	....	
23,000	92,000	.032050	.003667	....	....	
23,500	94,000	.035000	.002950	....	....	Micrometer removed
24,000	96,000	.0400	.0050	....	....	
24,500	98,000	.0450	.0050	....	....	
25,000	100,000	.0500	.0050	....	....	
25,500	102,000	.0600	.0100	....	....	
26,000	104,000	.0767	.0167	....	....	
26,180	104,720	.0850	.0083	....	....	
26,280	105,120	.1050	.0200	....	....	Ultimate strength.
22,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	105,120
Elastic limit per square inch of original section	do ..	63,000
Elongation per inch after rupture	inch..	0.1432
Elongation per inch under strain at elastic limit	do....	.002117
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		2.″65 from neck
Character of broken surface		granular, 50 per cent.; dull silky center 50 per cent.
Elongation of inch sections		″.07, ″.09, ″.11 (″.33 fracured section), ″.15, ″.11

No. 403.

Tension Test.

Marks on bar, $^{\text{R A}_3}_{6}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000283	.000183	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	.000017	.000017	
8,750	35,000	.001083	.000150	....	....	
10,000	40,000	.001250	.000167	.000033	.000016	
10,250	41,000	.001283	.000033	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001383	.000033	....	....	
11,250	45,000	.001417	.000034	.000033	0.	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001517	.000034	....	....	
12,250	49,000	.001550	.000033	....	....	
12,500	50,000	.001583	.000033	.000033	0.	
12,750	51,000	.001617	.000034	....	....	
13,000	52,000	.001650	.000033	....	....	
13,250	53,000	.001717	.000067	....	....	
13,500	54,000	.001733	.000016	....	....	
13,750	55,000	.001767	.000034	.000050	.000017	
14,000	56,000	.001800	.000033	....	....	
14,250	57,000	.001833	.000033	....	....	
14,500	58,000	.001900	.000067	....	....	
14,750	59,000	.001933	.000033	....	....	
15,000	60,000	.002000	.000067	.000050	0.	
15,250	61,000	.002017	.000017	....	....	
15,500	62,000	.002050	.000033	....	....	
15,750	63,000	.002083	.000033	....	....	Elastic limit.
16,000	64,000	.002150	.000067	....	....	
16,250	65,000	.002233	.000083	.000150	.000100	
16,500	66,000	.002417	.000184	....	....	
16,750	67,000	.002667	.000250	....	....	
17,000	68,000	.003200	.000533	....	....	
17,250	69,000	.004133	.000933	....	....	
17,500	70,000	.004950	.000817	.002500	.002350	
18,000	72,000	.006550	.001600	....	....	
18,500	74,000	.007933	.001383	....	....	
19,000	76,000	.010000	.002067	....	....	
19,500	78,000	.011833	.001833	....	....	
20,000	80,000	.013533	.001700	....	....	
20,500	82,000	.015667	.002134	....	....	
21,000	84,000	.017333	.001666	....	....	
21,500	86,000	.019833	.002500	....	....	
22,000	88,000	.021533	.001700	....	....	
22,500	90,000	.024000	.002467	....	....	
23,000	92,000	.027167	.003167	....	....	
23,500	94,000	.029333	.002166	....	....	
24,000	96,000	.032467	.003134	....	....	
24,500	98,000	.035867	.003400	....	....	
25,000	100,000	.040667	.004800	....	....	Micrometer removed.
25,500	102,000	.0450	.004333	....	....	
26,000	104,000	.0533	.0083	....	....	
26,500	106,000	.0617	.0084	....	....	
27,000	108,000	.0800	.0183	....	....	
27,160	108,640	.0983	.0183	....	....	Ultimate strength.
23,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 108,640
Elastic limit per square inch of original section ....do.... 63,000
Elongation per inch after rupture ....inch.. 0.1317
Elongation per inch under strain at elastic limit ....do.... .002083
Reduction in diameter at point of rupture....................do.... .134
Reduction in area after rupture, per centum of original section.................... 41.9
Position of rupture ....".75 from neck
Character of broken surface.................... granular 60 per cent., dull smoky center 40 per cent.
Elongation of inch sections ....".08, ".09, ".11, ".11, ".11 (".29 fractured section)

No. 337.

Tension Test.

Marks on bar, $^{\mathrm{E\,A11}}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000116	.000116	0.	....	
2,500	10,000	.000283	.000167	0.	....	
3,750	15,000	.000416	.000133	0.	....	
5,000	20,000	.000550	.000134	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000866	.000166	0.	....	
8,750	35,000	.001033	.000167	0.	....	
10,000	40,000	.001200	.000167	0.	....	
10,250	41,000	.001200	0.	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001266	.000033	....	....	
11,000	44,000	.001300	.000034	....	....	
11,250	45,000	.001333	.000033	.000033	.000033	
11,500	46,000	.001383	.000050	....	....	
11,750	47,000	.001400	.000017	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001466	.000033	....	....	
12,500	50,000	.001500	.000034	.000050	.000017	
12,750	51,000	.001550	.000050	....	....	
13,000	52,000	.001583	.000033	....	....	
13,250	53,000	.001616	.000033	....	....	
13,500	54,000	.001650	.000034	....	....	
13,750	55,000	.001683	.000033	.000050	0.	
14,000	56,000	.001716	.000033	....	....	
14,250	57,000	.001750	.000034	....	....	
14,500	58,000	.001783	.000033	....	....	
14,750	59,000	.001816	.000033	....	....	
15,000	60,000	.001850	.000034	.000066	.000016	Elastic limit.
15,250	61,000	.001933	.000083	....	....	
15,500	62,000	.002000	.000067	....	....	
15,750	63,000	.002100	.000100	....	....	
16,000	64,000	.002233	.000133	....	....	
16,250	65,000	.002400	.000167	.000366	.000300	
16,500	66,000	.002700	.000300	....	....	
16,750	67,000	.002966	.000266	....	....	
17,000	68,000	.003550	.000584	....	....	
17,250	69 000	.004366	.000816	....	....	
17,500	70,000	.005500	.001134	.003133	.002767	
18,000	72,000	.006966	.001466	....	....	
18,500	74,000	.008583	.001617	....	....	
19,000	76,000	.010833	.002250	....	....	
19,500	78,000	.012333	.001500	....	....	
20,000	80,000	.014333	.002000	....	....	
20,500	82,000	.016333	.002000	....	....	
21,000	84,000	.018166	.001833	....	....	
21,500	86,000	.020600	.002434	....	....	
22,000	88,000	.022716	.002116	....	....	
22,500	90,000	.025000	.002284	....	....	
23,000	92,000	.027966	.002966	....	....	
23,500	94,000	.031200	.003234	....	....	
24,000	96,000	.034666	.003466	....	....	
24,500	98,000	.038033	.003367	....	....	
25,000	100,000	.042883	.004850	....	....	Micrometer removed.
25,500	102,000	.0483	.005417	....	....	
26,000	104,000	.0550	.0067	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
26,500	106,000	.0667	.0117	....	....	
27,000	108,000	.0950	.0183	....	....	
27,100	108,400	.1183	.0333	....	....	Ultimate strength.
24,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8598
Hardness		25.13
Tensile strength per square inch of original section	pounds..	108,400
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.15
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1" from middle of stem
Character of broken surface		fine granular 70 per cent., dull center 30 per cent.
Elongation of inch sections		".11, ".14, ".12 (".24 fractured sections), ".18, ".1

No. 347.

Tension Test.

Marks on bar, $^{B}_{2}{}^{Au}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000366	.000133	0.	....	
5,000	20,000	.000500	.000134	0.	....	
6,250	25,000	.000633	.000133	0.	....	
7,500	30,000	.000833	.000200	0.	....	
8,750	35,000	.000966	.000133	0.	....	
10,000	40,000	.001166	.000200	0.	....	
10,250	41,000	.001166	0.	....	....	
10,500	42,000	.001200	.000034	....	....	
10,750	43,000	.001233	.000033	....	....	
11,000	44,000	.001266	.000033	....	....	
11,250	45,000	.001300	.000034	0.	....	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001366	.000033	....	....	
12,000	48,000	.001400	.000034	....	....	
12,250	49,000	.001400	0.	....	....	
12,500	50,000	.001433	.000033	0.	....	
12,750	51,000	.001500	.000067	....	....	
13,000	52,000	.001533	.000033	....	....	
13,250	53,000	.001566	.000033	....	....	
13,500	54,000	.001600	.000034	....	....	
13,750	55,000	.001633	.000033	.000033	.000033	
14,000	56,000	.001733	.000100	....	....	
14,250	57,000	.001733	0.	....	....	
14,500	58,000	.001766	.000033	....	....	
14,750	59,000	.001800	.000034	....	....	
15,000	60,000	.001900	.000100	.000033	0.	
15,250	61,000	.002033	.000133	....	....	
15,500	62,000	.002066	.000033	....	....	
15,750	63,000	.002100	.000034	....	....	Elastic limit.
16,000	64,000	.002200	.000100	....	....	
16,250	65,000	.002433	.000233	.000333	.000300	
16,500	66,000	.002766	.000333	....	....	
16,750	67,000	.003166	.000400	....	....	
17,000	68,000	.003766	.000600	....	....	
17,250	69,000	.004600	.000834	....	....	
17,500	70,000	.005633	.001033	.003133	.002800	
18,000	72,000	.007166	.001533	....	....	
18,500	74,000	.008933	.001767	....	....	
19,000	76,000	.010533	.001600	....	....	
19,500	78,000	.012333	.001800	....	....	
20,000	80,000	.014900	.002567	.011766	.008633	Rested under initial load 15 hours.
20,000	80,000	.015100	.000200	....	....	
20,500	82,000	.016233	.001133	....	....	
21,000	84,000	.018400	.002167	....	....	
21,500	86,000	.020700	.002300	....	....	
22,000	88,000	.023266	.002566	....	....	
22,500	90,000	.025933	.002667	....	....	
23,000	92,000	.028833	.002900	....	....	
23,500	94,000	.031166	.002333	....	....	
24,000	96,000	.034333	.003167	....	....	
24,500	98,000	.038000	.004267	....	....	
25,000	100,000	.043266	.004066	....	....	Micrometer removed.
25,500	102,000	.0467	.003434	....	....	
26,000	104,000	.0533	.0066	....	....	
26,500	106,000	.0633	.0100	....	....	
27,000	108,000	.0900	.0267	....	....	Ultimate strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	108,000
Elastic limit per square inch of original section	do....	63,000
Elongation per inch after rupture	inch..	0.1666
Elongation per inch under strain at elastic limit	do....	.002100
Reduction in diameter at point of rupture	do...	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″ from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		″.08, ″.15, (″.27 fractured section)

No. 338.

Tension Test.

Marks on bar, $^{\text{E A11}}_{\ \ 8}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000416	.000166	0.	....	
5,000	20,000	.000566	.000150	0.	....	
6,250	25,000	.000716	.000150	0.	....	
7,500	30,000	.000883	.000167	0.	....	
8,750	35,000	.001050	.000167	0.	....	
10,000	40,000	.001216	.000166	0.	....	
10,250	41,000	.001250	.000034	....	....	
10,500	42,000	.001283	.000033	....	....	
10,750	43,000	.001316	.000033	....	....	
11,000	44,000	.001350	.000034	....	....	
11,250	45,000	.001383	.000033	.000016	.000016	
11,500	46,000	.001416	.000033	....	....	
11,750	47,000	.001450	.000034	....	....	
12,000	48,000	.001483	.000033	....	....	
12,250	49,000	.001516	.000033	....	....	
12,500	50,000	.001566	.000050	.000033	.000017	
12,750	51,000	.001600	.000034	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001666	.000033	....	....	
13,500	54,000	.001700	.000034	....	....	
13,750	55,000	.001733	.000033	.000050	.000017	
14,000	56,000	.001800	.000067	....	....	
14,250	57,000	.001816	.000016	....	....	
14,500	58,000	.001866	.000050	....	....	
14,750	59,000	.001916	.000050	....	....	Elastic limit.
15,000	60,000	.002033	.000117	.000116	.000066	
15,250	61,000	.002083	.000050	....	....	
15,500	62,000	.002250	.000167	....	....	
15,750	63,000	.002416	.000166	....	....	
16,000	64,000	.002666	.000250	....	....	
16,250	65,000	.003166	.000500	.001016	.000900	
16,500	66,000	.003566	.000400	....	....	
16,750	67,000	.003900	.000334	....	....	
17,000	68,000	.004683	.000783	....	....	
17,250	69,000	.005266	.000583	....	....	
17,500	70,000	.006000	.000734	.003583	.002567	
18,000	72,000	.007433	.001433	....	....	
18,500	74,000	.009200	.001767	....	....	
19,000	76,000	.010966	.001766	....	....	
19,500	78,000	.012916	.001950	....	....	
20,000	80,000	.014633	.001717	....	....	
20,500	82,000	.016200	.001567	....	....	
21,000	84,000	.018066	.001866	....	....	
21,500	86,000	.020283	.002217	....	....	
22,000	88,000	.022316	.002033	....	....	
22,500	90,000	.024783	.002467	....	....	
23,000	92,000	.027283	.002500	....	....	
23,500	94,000	.030366	.003083	....	....	
24,000	96,000	.033200	.002834	....	....	
24,500	98,000	.037033	.003833	....	....	
25,000	100,000	.041116	.004083	....	....	Micrometer removed.
25,500	102,000	.0483	.007184	....	....	
26,000	104,000	.0533	.0050	....	....	
26,500	106,000	.0650	.0117	....	....	
27,000	108,000	.0816	.0166	....	....	
27,150	108,600	.1000	.0184	....	....	Ultimate strength.
24,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	108,600
Elastic limit per square inch of original section	do ...	59,000
Elongation per inch after rupture	inch..	0.115
Elongation per inch under strain at elastic limit	do	.001916
Reduction in diameter at point of rupture	do	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		".90 from neck
Character of broken surface		fine granular; dull spot; ".1 eccentric
Elongation of inch sections		".05, ".07, ".10, ".12, ".18 (".22 fractured section)

No. 348.

Tension Test.

Marks on bar, $^{B}\underset{4}{Au}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	0.	....	
3,750	15,000	.000366	.000133	0.	....	
5,000	20,000	.000566	.000200	0.	....	
6,250	25,000	.000766	.000200	0.	....	
7,500	30,000	.000866	.000100	0.	....	
8,750	35,000	.001000	.000134	0.	....	
10,000	40,000	.001200	.000200	0.	....	
10,250	41,000	.001200	0.	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001266	.000033	....	....	
11,000	44,000	.001300	.000034	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001366	.000033	....	....	
11,750	47,000	.001400	.000034	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001466	.000033	....	....	
12,500	50,000	.001533	.000067	.000066	.000066	
12,750	51,000	.001566	.000033	....	....	
13,000	52,000	.001600	.000034	....	....	
13,250	53,000	.001633	.000033	....	....	
13,500	54,000	.001666	.000033	....	....	
13,750	55,000	.001700	.000034	.000100	.000034	
14,000	56,000	.001766	.000066	....	....	Elastic limit.
14,250	57,000	.001866	.000100	....	....	
14,500	58,000	.001966	.000100	....	....	
14,750	59,000	.002066	.000100	....	....	
15,000	60,000	.002200	.000134	.000333	.000233	
15,250	61,000	.002433	.000233	....	....	
15,500	62,000	.002733	.000300	....	....	
15,750	63,000	.003233	.000500	....	....	
16,000	64,000	.003766	.000533	....	....	
16,250	65,000	.004566	.000800	.002233	.001900	
16,500	66,000	.005266	.000700	....	....	
16,750	67,000	.006000	.000734	....	....	
17,000	68,000	.006666	.000666	....	....	
17,250	69,000	.007100	.000434	....	....	
17,500	70,000	.008766	.001666	....	....	
18,000	72,000	.010033	.001267	....	....	
18,500	74,000	.011666	.001633	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section..............................pounds.. 74,000
Elastic limit per square inch of original section..............................do.... 56,000
Elongation per inch after rupture..............................inch.. 0.100
Elongation per inch under strain at elastic limit..............................do.... .001766
Reduction in diameter at point of rupture..............................do.... .000
Reduction in area after rupture, per centum of original section.............................. .000
Position of rupture.............................. 1″.10 from neck
Character of broken surface, granular, silvery, luster; fracture occurred at a defective spot in the metal, covering 20 per cent. of the fractured surface.
Elongation of inch sections..............................″.01, ″.01, ″.01

No. 404.

Tension Test.

Marks on bar, $^{\text{R}}\underset{5}{\text{A}}^{11}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000567	.000134	0.		
6,250	25,000	.000717	.000150	0.		
7,500	30,000	.000900	.000183	0.		
8,750	35,000	.001067	.000167	0.		
10,000	40,000	.001250	.000183	.000017	.000017	
10,250	41,000	.001267	.000017			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001367	.000034			
11,250	45,000	.001400	.000033	.000017	0.	
11,500	46,000	.001450	.000050			
11,750	47,000	.001467	.000017			
12,000	48,000	.001517	.000050			
12,250	49,000	.001550	.000033			
12,500	50,000	.001583	.000033	.000017	0.	
12,750	51,000	.001617	.000034			
13,000	52,000	.001650	.000033			
13,250	53,000	.001683	.000033			
13,500	54,000	.001717	.000034			
13,750	55,000	.001767	.000050	.000033	.000016	
14,000	56,000	.001800	.000033			
14,250	57,000	.001850	.000050			
14,500	58,000	.001917	.000067			
14,750	59,000	.001950	.000033			
15,000	60,000	.002017	.000067	.000067	.000034	
15,250	61,000	.002083	.000066			
15,500	62,000	.002133	.000050			Elastic limit.
15,750	63,000	.002233	.000100			
16,000	64,000	.002467	.000234			
16,250	65,000	.002733	.000266	.000583	.000516	
16,500	66,000	.003217	.000484			
16,750	67,000	.003550	.000333			
17,000	68,000	.004467	.000917			
17,250	69,000	.005483	.001016			
17,500	70,000	.006367	.000884	.003850	.003267	
18,000	72,000	.007983	.001616			
18,500	74,000	.009667	.001684			
19,000	76,000	.011417	.001750			
19,500	78,000	.013000	.001583			
20,000	80,000	.014833	.001833			
20,500	82,000	.016800	.001967			
21,000	84,000	.019167	.002367			
21,500	86,000	.020867	.001700			
22,000	88,000	.023050	.002183			
22,500	90,000	.025467	.002417			
23,000	92,000	.028633	.003166			
23,500	94,000	.031250	.002617			
24,000	96,000	.034500	.003250			
24,500	98,000	.038000	.003500			
25,000	100,000	.044167	.006167			Micrometer removed.
25,500	102,000	.0500	.005833			
26,000	104,000	.0583	.0083			
26,150	104,600					Ultimate strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 104,600
Elastic limit per square inch of original section .... do.... 62,000
Elongation per inch after rupture .... inch.. 0.0583
Elongation per inch under strain at elastic limit .... do.... .002183
Reduction in diameter at point of rupture .... do.... .024
Reduction in area after rupture, per centum of original section 8.4
Position of rupture .... 2″.25 from neck
Character of broken surface, granular, radiating from a small dull spot at circumference of fractured surface.
Elongation of inch sections .... ″.06, ″.06, ″.07 (″.07 fractured section), ″.05, ″.04

No. 405.

Tension Test.

Marks on bar, $^{\text{R A11}}_{\ \ 6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	.000017	.000017	
2,500	10,000	.000300	.000167	.000017	0.	
3,750	15,000	.000467	.000167	.000033	.000016	
5,000	20,000	.000600	.000133	.000033	0.	
6,250	25,000	.000783	.000183	.000033	0.	
7,500	30,000	.000950	.000167	.000033	0.	
8,750	35,000	.001100	.000150	.000033	0.	
10,000	40,000	.001283	.000183	.000033	0.	
10,250	41,000	.001300	.000017	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	.000050	.000017	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001517	.000050	....	....	
12,000	48,000	.001550	.000033	....	....	
12,250	49,000	.001583	.000033	....	....	
12,500	50,000	.001617	.000034	.000030	0.	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001717	.000017	....	....	
13,500	54,000	.001767	.000050	....	....	
13,750	55,000	.001800	.000033	.000083	.000033	
14,000	56,000	.001883	.000083	....	....	
14,250	57,000	.001933	.000050	....	....	
14,500	58,000	.001983	.000050	....	....	Elastic limit.
14,750	59,000	.002050	.000067	....	....	
15,000	60,000	.002150	.000100	.000233	.000150	
15,250	61,000	.002383	.000233	....	....	
15,500	62,000	.002550	.000167	....	....	
15,750	63,000	.002800	.000250	....	....	
16,000	64,000	.003167	.000367	....	....	
16,250	65,000	.003800	.000633	.001633	.000400	
16,500	66,000	.004483	.000683	....	....	
16,750	67,000	.004900	.000417	....	....	
17,000	68,000	.005917	.001017	....	....	
17,250	69,000	.006833	.000916	....	....	
17,500	70,000	.008000	.001167	.005367	.003734	
18,000	72,000	.009233	.001233	....	....	
18,500	74,000	.010700	.001467	....	....	
19,000	76,000	.012383	.001683	....	....	
19,500	78,000	.014500	.002117	....	....	
20,000	80,000	.016167	.001667	....	....	
20,500	82,000	.018167	.002000	....	....	
21,000	84,000	.020167	.002000	....	....	
21,500	86,000	.022467	.002300	....	....	
22,000	88,000	.024417	.001950	....	....	
22,500	90,000	.027333	.002916	....	....	
23,000	92,000	.029667	.002334	....	....	
23,500	94,000	.032717	.003050	....	....	
24,000	96,000	.036333	.003616	....	....	
24,500	98,000	.039833	.003500	....	....	Micrometer removed.
25,000	100,000	.0467	.006867	....	....	
25,500	102,000	.0533	.0066	....	....	
26,000	104,000	.0600	.0067	....	....	
26,500	106,000	.0717	.0117	....	....	
26,920	107,680	.0983	.0266	....	....	Ultimate strength.
24,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107,680
Elastic limit per square inch of original section	do ...	58,000
Elongation per inch after rupture	inch..	0.1150
Elongation per inch under strain at elastic limit	do....	.001983
Reduction in diameter at point of rupture	do....	.004
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.15 from neck
Character of broken surface		granular 80 per cent., dull, smoky center 20 per cent
Elongation of inch sections		″.08, ″ 08, ″.09, ″.10, ″.16 (″.18 fractured section)

No. 408.

Compression Test.

[Hoop A_8, 8″ steel B. L. rifle.]

Marks on bar, $\frac{RA_8}{8}$
Length, 8″.972.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1, 000	1, 000	0.	0.	0.	0.	**Initial load.**
5, 000	5, 000	.000083	.000083	0.	....	
10, 000	10, 000	.000250	.000167	0.	....	
15, 000	15, 000	.000400	.000150	0.	....	
20, 000	20, 000	.000567	.000107	.000017	.000017	
25, 000	25, 000	.000717	.000150	.000017	0.	
30, 000	30, 000	.000867	.000150	.000033	.000016	
31, 000	31, 000	.000883	.000016	....	....	
32, 000	32, 000	.000900	.000017	....	....	
33, 000	33, 000	.000933	.000033	....	....	
34, 000	34, 000	.001000	.000067	....	....	
35, 000	35, 000	.001017	.000017	.000050	.000017	
36, 000	36, 000	.001050	.000033	....	....	
37, 000	37, 000	.001083	.000033	....	....	
38, 000	38, 000	.001100	.000017	....	....	
39, 000	39, 000	.001133	.000033	....	....	
40, 000	40, 000	.001167	.000034	.000067	.000017	
41, 000	41, 000	.001200	.000033	....	....	
42, 000	42, 000	.001233	.000033	....	....	
43, 000	43, 000	.001250	.000017	....	....	
44, 000	44, 000	.001283	.000033	....	....	
45, 000	45, 000	.001333	.000050	.000083	.000016	
46, 000	46, 000	.001367	.000034	....	....	
47, 000	47, 000	.001400	.000033	....	....	
48, 000	48, 000	.001433	.000033	....	....	
49, 000	49, 000	.001483	.000050	....	....	
50, 000	50, 000	.001517	.000034	.000083	0.	
51, 000	51, 000	.001533	.000016	....	....	
52, 000	52, 000	.001567	.000034	....	....	
53, 000	53, 000	.001583	.000016	....	....	
54, 000	54, 000	.001650	.000067	....	....	
55, 000	55, 000	.001683	.000033	.000100	.000017	
56, 000	56, 000	.001700	.000017	....	....	
57, 000	57, 000	.001717	.000017	....	....	
58, 000	58, 000	.001750	.000033	....	....	
59, 000	59, 000	.001809	.000050	....	....	
60, 000	60, 000	.001850	.000050	.000100	0.	
61, 000	61, 000	.001867	.000017	....	....	
62, 000	62, 000	.001900	.000033	....	....	
63, 000	63, 000	.001933	.000033	....	....	
64, 000	64, 000	.001983	.000050	....	....	
65, 000	65, 000	.002050	.000067	.000133	.000083	**Elastic limit.**
66, 000	66, 000	.002250	.000200	....	....	**Perceptible deflection.**
67, 000	67, 000	.002400	.000150	....	....	
68, 000	68, 000	.002850	.000450	....	....	
69, 000	60, 000	.003117	.000267	....	....	
70, 000	70, 000	.003417	.000300	.001317	.001184	
82, 800	82, 800	....	....	....	....	**Ultimate strength.**

General summary.

Elastic limit per square inch of original section	pounds..	65, 000
Compression per inch under stress at elastic limit............	inch..	0.002050
Ultimate strength per square inch of original section]............	pounds..	82, 800
Manner of failure		triple flexure
Maximum deflection after the test	inch..	.45

No. 409.

Compression Test.

[Hoop A_6 8″ B. L. rifle.]

Marks on bar, $\underset{4}{{}^{R}A_{6}}$
Length, ″.895.
Diameter, 1″.129.
Sectional area, 1 square inch.

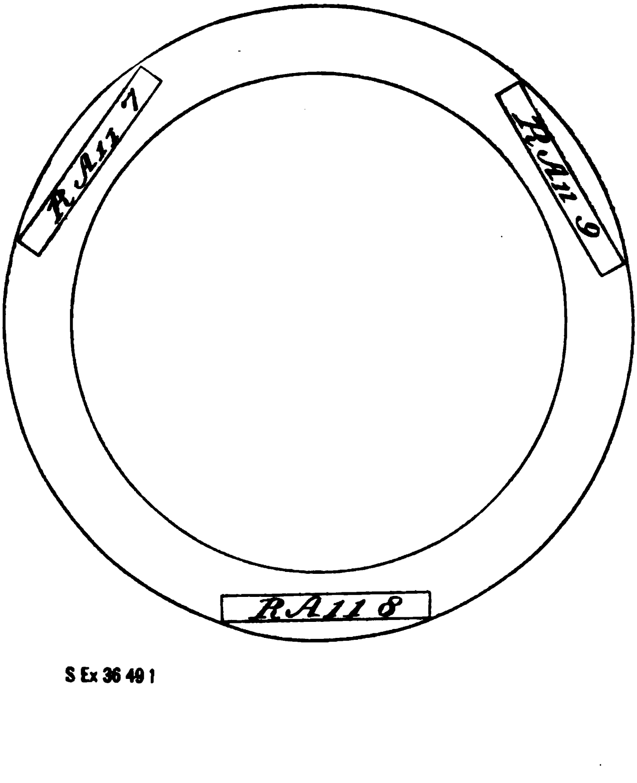
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000117	.000117	0.	....	
10,000	10,000	.000267	.000150	0.	....	
15,000	15,000	.000433	.000166	0.	....	
20,000	20,000	.000583	.000150	0.	....	
25,000	25,000	.000750	.000167	0.	....	
30,000	30,000	.000867	.000117	0.	....	
31,000	31,000	.000933	.000066	....	....	
32,000	32,000	.000950	.000017	....	....	
33,000	33,000	.000967	.000017	....	....	
34,000	34,000	.001000	.000033	....	....	
35,000	35,000	.001033	.000033	0.	....	
36,000	36,000	.001083	.000050	....	....	
37,000	37,000	.001117	.000034	....	....	
38,000	38,000	.001150	.000033	....	....	
39,000	39,000	.001183	.000033	....	....	
40,000	40,000	.001233	.000050	0.	....	
41,000	41,000	.001267	.000034	....	....	
42,000	42,000	.001300	.000033	....	....	
43,000	43,000	.001333	.000033	....	....	
44,000	44,000	.001350	.000017	....	....	
45,000	45,000	.001383	.000033	.000017	.000017	
46,000	46,000	.001417	.000034	....	....	
47,000	47,000	.001450	.000033	....	....	
48,000	48,000	.001483	.000033	....	....	
49,000	49,000	.001500	.000017	....	....	
50,000	50,000	.001533	.000033	.000017	0.	
51,000	51,000	.001567	.000034	....	....	
52,000	52,000	.001600	.000033	....	....	
53,000	53,000	.001633	.000033	....	....	
54,000	54,000	.001667	.000034	....	....	Perceptible deflection.
55,000	55,000	.0017 0	.000033	.000017	0.	
56,000	56,000	.001717	.000017	....	....	
57,000	57,000	.001750	.000033	....	....	
58,000	58,000	.001800	.000050	....	....	
59,000	59,000	.001833	.000033	....	....	
60,000	60,000	.001867	.000034	.000033	.000016	Deflection disappeared when released to initial load.
61,000	61,000	.001917	.000050	....	....	
62,000	62,000	.001967	.000050	....	....	
63,000	63,000	.002000	.000033	....	....	Elastic limit.
64,000	64,000	.002050	.000050	....	....	
65,000	65,000	.002100	.000050	.000083	.000050	
66,000	66,000	.002167	.000067	....	....	
67,000	67,000	.002283	.000116	....	....	
68,000	68,000	.002417	.000134	....	....	
69,000	69,000	.002733	.000316	....	....	
70,000	70,000	.003283	.000550	.001217	.001134	
78,400	78,400	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	63,000
Compression per inch under stress at elastic limit	inch..	0.002000
Ultimate strength per square inch of original section	pounds..	78,400
Manner of failure,		triple flexure
Maximum deflection after the test	inch..	08

8" Steel B. L. Rifle

New hoop A11



No. 410.

Tension Test.

Marks on bar, $^{R}\,{}^{A_{11}}_{7}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000767	.000150	0.	....	
7,500	30,000	.000950	.000183	.000017	.000017	
8,750	35,000	.001100	.000150	.000017	0.	
10,000	40,000	.001267	.000167	.000017	0.	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001383	.000033	....	....	
11,250	45,000	.001417	.000034	.000017	0.	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001517	.000034	....	....	
12,250	49,000	.001550	.000033	....	....	
12,500	50,000	.001600	.000050	.000033	.000016	
12,750	51,000	.001650	.000050	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001767	.000050	....	....	
13,750	55,000	.001833	.000066	.000100	.000067	Elastic limit.
14,000	56,000	.001950	.000117	....	....	
14,250	57,000	.002017	.000067	....	....	
14,500	58,000	.002200	.000183	....	....	
14,750	59,000	.002433	.000233	....	....	
15,000	60,000	.002867	.000434	.000917	.000817	
15,250	61,000	.003200	.000333	....	....	
15,500	62,000	.003867	.000667	....	....	
15,750	63,000	.004717	.000850	....	....	
16,000	64,000	.005717	.001000	....	....	
16,250	65,000	.006533	.000816	.004217	.003300	
16,500	66,000	.007167	.000634	....	....	
16,750	67,000	.007800	.000633	....	....	
17,000	68,000	.008633	.000833	....	....	
17,250	69,000	.009467	.000834	....	....	
17,500	70,000	.010767	.001300	.008117	.003900	
18,000	72,000	.012133	.001366	....	....	
18,500	74,000	.013883	.001750	....	....	
19,000	76,000	.016133	.002250	....	....	
19,500	78,000	.018633	.002500	....	....	
20,000	80,000	.020300	.001667	....	....	
20,500	82,000	.022250	.001950	....	....	
21,000	84,000	.024883	.002633	....	....	
21,500	86,000	.027500	.002617	....	....	
22,000	88,000	.030333	.002833	....	....	
22,500	90,000	.033717	.003384	....	....	Micrometer removed.
23,000	92,000	.0367	.002983	....	....	
23,500	94,000	.0433	.0066	....	....	
24,000	96,000	.0483	.0050	....	....	
24,500	98,000	.0550	.0067	....	....	
25,000	100,000	.0633	.0083	....	....	
25,500	102,000	.0817	.0184	....	....	
25,810	103,240	.1133	.0316	....	....	Ultimate strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8611
Hardness		23.17
Tensile strength per square inch of original section	pounds	103,240
Elastic limit per square inch of original section	do	55,000
Elongation per inch after rupture	inch	0.1667
Elongation per inch under strain at elastic limit	do	.001833
Reduction in diameter at point of rupture	do	.184
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		2″ from neck
Character of broken surface		granular, with dull smoky center
Elongation of inch sections		″.10 (″.31 fractured section), ″.18, ″.19, ″.14, ″.08

No. 411.

Tension Test.

Marks on bar, $^{R}{}^{A_{11}}_{8}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000267	.000150	0.	....	
3, 750	15, 000	.000433	.000166	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000750	.000150	0.	....	
7, 500	30, 000	.000917	.000167	0.	....	
8, 750	35, 000	.001100	.000183	0.	....	
10, 000	40, 000	.001267	.000167	0.	....	
10, 250	41, 000	.001283	.000016	....	....	
10, 500	42, 000	.001317	.000034	....	....	
10, 750	43, 000	.001350	.000033	....	....	
11, 000	44, 000	.001383	.000033	....	....	
11, 250	45, 000	.001417	.000034	0.	....	
11, 500	46, 000	.001433	.000016	....	....	
11, 750	47, 000	.001467	.000034	....	....	
12, 000	48, 000	.001500	.000033	....	....	
12, 250	49, 000	.001533	.000033	....	....	
12, 500	50, 000	.001600	.000067	.000033	.000033	
12, 750	51, 000	.001617	.000017	....	....	
13, 000	52, 000	.001650	.000033	....	....	
13, 250	53, 000	.001700	.000050	....	....	
13, 500	54, 000	.001750	000050	....	....	
13, 750	55, 000	.001783	.000033	.000050	.000017	Elastic limit.
14, 000	56, 000	.001883	.000100	....	....	
14, 250	57, 000	.001933	.000050	....	....	
14, 500	58, 000	.002050	.000117	....	....	
14, 750	59, 000	.002133	.000083	....	....	
15, 000	60, 000	.002350	.000217	.000383	.000333	
15, 250	61, 000	.002567	.000217	....	....	
15, 500	62, 000	.002817	.000250	....	....	
15, 750	63, 000	.003217	.000400	....	....	
16, 000	64, 000	.004017	.000800	....	....	
16, 250	65, 000	.004800	.000783	.002550	.002167	
16, 500	66, 000	.005450	.000650	....	....	
16, 750	67, 000	.006200	.000750	....	....	
17, 000	68, 000	.007283	.001083	....	....	
17, 250	69, 000	.007933	.000650	....	....	
17, 500	70, 000	.009233	.001300	.006617	.004067	
18, 000	72, 000	.010667	.001434	....	....	
18, 500	74, 000	.012233	.001566	....	....	
19, 000	76, 000	.014400	.002167	....	....	
19, 500	78, 000	.016233	.001833	....	....	
20, 000	80, 000	.018400	.002167	....	....	
20, 500	82, 000	.020400	.002000	....	....	
21, 000	84, 000	.022667	.002267	....	....	
21, 500	86, 000	.025167	.002500	....	....	
22, 000	88, 000	.027833	.002666	....	....	
22, 500	90, 000	.030750	.002917	....	....	Micrometer removed.
23, 000	92, 000	.0350	.004250	....	....	
23, 500	94, 000	.0383	.0033	....	....	
24, 000	96, 000	.0450	.0067	....	....	
24, 500	98, 000	.0483	.0033	....	....	
25, 000	100, 000	.0567	.0084	....	....	
25, 500	102, 000	.0667	.0100	....	....	
26, 000	104, 000	.0817	.0150	....	....	
26, 360	105, 440	.1133	.0316	....	....	Ultimate strength.
23, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	105, 440
Elastic limit per square inch of original section	do....	55, 000
Elongation per inch after rupture	inch..	0. 1567
Elongation per inch under strain at elastic limit	do...	.001783
Reduction in diameter at point of rupture	do...	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		".4 from middle
Character of broken surface		granular, with dull smoky center
Elongation of inch sections (".30 fractured section)		".11, ".15, ".17, ".12, ".

No. 412.

Tension Test.

Marks on bar, $\mathrm{R}\,\underset{9}{\mathrm{A}}{}_{11}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000717	.000117	0.	....	
7,500	30,000	.000917	.000200	0.	....	
8,750	35,000	.001067	.000150	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000033	.000033	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001583	.000050	.000050	.000017	
12,750	51,000	.001617	.000034	....	....	
13,000	52,000	.001650	.000033	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001717	.000034	....	....	
13,750	55,000	.001750	.000033	.000050	0.	
14,000	56,000	.001817	.000067	....	....	
14,250	57,000	.001867	.000050	....	....	Elastic limit.
14,500	58,000	.002017	.000150	....	....	
14,750	59,000	.002067	.000050	....	....	
15,000	60,000	.002233	.000166	.000333	.000283	
15,250	61,000	.002500	.000267	....	....	
15,500	62,000	.002833	.000333	....	....	
15,750	63,000	.003217	.000384	....	....	
16,000	64,000	.003667	.000450	....	....	
16,250	65,000	.004417	.000750	.002300	.001967	
16,500	66,000	.005333	.000916	....	....	
16,750	67,000	.005917	.000584	....	....	
17,000	68,000	.007000	.001083	....	....	
17,250	69,000	.007833	.000833	....	....	
17,500	70,000	.009133	.001300	.006612	.004312	
18,000	72,000	.010350	.001217	....	....	
18,500	74,000	.012333	.001983	....	....	
19,000	76,000	.014500	.002167	....	....	
19,500	78,000	.016500	.002000	....	....	
20,000	80,000	.018333	.001833	....	....	
20,500	82,000	.020333	.002000	....	....	
21,000	84,000	.022800	.002467	....	....	
21,500	86,000	.025000	.002200	....	....	
22,000	88,000	.027800	.002800	....	....	
22,500	90,000	.031000	.003200	....	....	Micrometer removed.
23,000	92,000	.0367	.0057	....	....	
23,500	94,000	.0400	.0033	....	....	
24,000	96,000	.0450	.0050	....	....	
24,500	98,000	.0517	.0067	....	....	
25,000	100,000	.0567	.0050	....	....	
25,500	102,000	.0700	.0133	....	....	
26,000	104,000	.0900	.0200	....	....	
26,080	104,320	.1067	.0167	....	....	Ultimate strength.
23,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 104,320
Elastic limit per square inch of original section .... do.... 57,000
Elongation per inch after rupture .... inch.. 0.1217
Elongation per inch under strain at elastic limit .... do.... .001867
Reduction in diameter at point of rupture .... do ... .124
Reduction in area after rupture, per centum of original section 89.2
Position of rupture .... 2″.20 from neck
Character of broken surface .... granular, with dull smoky center
Elongation of inch sections .... ″.09 (″26 fractured section), ″.17, ″.10, ″.09, ″.08

No. 410.

Compression Test.

[Hoop B_2, 8-inch steel B. L. rifle.]

Marks on bar, $^{R}{}_{8}{}^{B_2}$
Length, 8″.990.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000100	.000100	0.		
10,000	10,000	.000233	.000133	0.		
15,000	15,000	.000400	.000167	0.		
20,000	20,000	.000567	.000167	0.		
25,000	25,000	.000717	.000150	0.		
30,000	30,000	.000883	.000166	.000017	.000017	
31,000	31,000	.000900	.000017			
32,000	32,000	.000933	.000033			
33,000	33,000	.000967	.000034			
34,000	34,000	.001000	.000033			
35,000	35,000	.001033	.000033	.000017	0.	
36,000	36,000	.001067	.000034			
37,000	37,000	.001100	.000033			
38,000	38,000	.001133	.000033			
39,000	39,000	.001167	.000034			
40,000	40,000	.001200	.000033	.000033	.000016	
41,000	41,000	.001233	.000033			
42,000	42,000	.001267	.000034			
43,000	43,000	.001300	.000033			
44,000	44,000	.001333	.000033			
45,000	45,000	.001383	.000050	.000050	.000017	
46,000	46,000	.001417	.000034			
47,000	47,000	.001450	.000033			
48,000	48,000	.001467	.000017			
49,000	49,000	.001500	.000033			
50,000	50,000	.001533	.000033	.000050	0.	
51,000	51,000	.001567	.000034			
52,000	52,000	.001600	.000033			
53,000	53,000	.001633	.000033			
54,000	54,000	.001667	.000034			
55,000	55,000	.001700	.000033	.000067	.000017	
56,000	56,000	.001733	.000033			
57,000	57,000	.001767	.000034			
58,000	58,000	.001800	.000033			
59,000	59,000	.001833	.000033			
60,000	60,000	.001867	.000034	.000067		
61,000	61,000	.001900	.000033			Elastic limit.
62,000	62,000	.001950	.000050			
63,000	63,000	.002050	.000100			
64,000	64,000	.002150	.000100			Perceptible deflection.
65,000	65,000	.002267	.000117	.000300	.000233	
66,000	66,000	.002433	.000166			
67,000	67,000	.002600	.000167			
68,000	68,000	.002800	.000200			
69,000	69,000	.002933	.000133			
70,000	70,000	.003083	.000150	.000967	.000667	
84,100	84,100					Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	61,000
Compression per inch under stress at elastic limit	inch..	0.001900
Ultimate strength per square inch of original section	pounds..	84,100
Manner of failure		triple flexure
Maximum deflection after the test	inch..	.27

No. 411.

Compression Test.

[Hoop B_4, 8″ steel B. L. rifle.]

Marks on bar, $^{B\;B_4}_{\;\;4}$
Length, 8″.970.
Diameter, 1″.129.
Sectional area, 1 square inch.

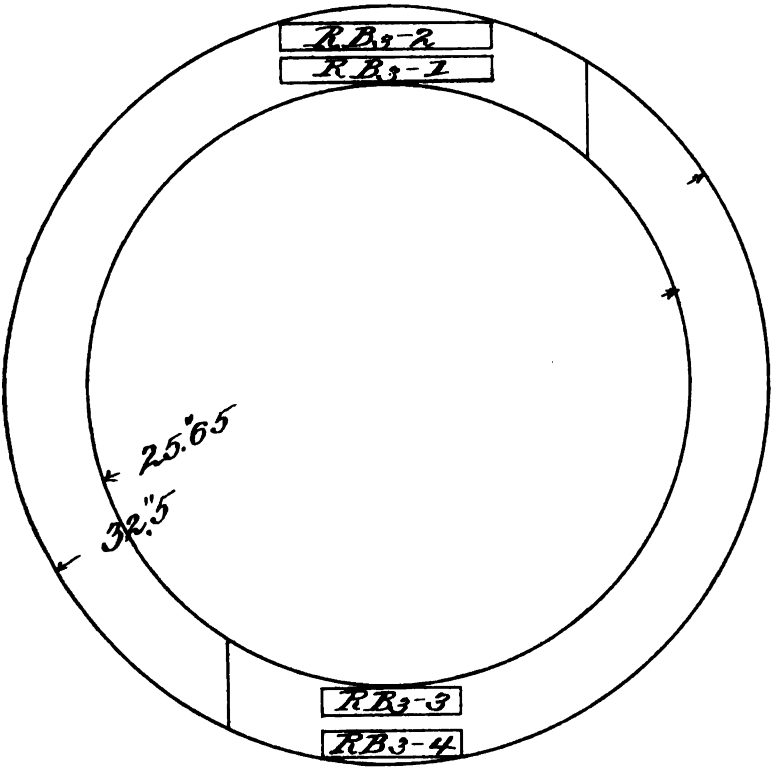
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000100	.000100	0.	....	
10,000	10,000	.000267	.000167	0.	....	
15,000	15,000	.000433	.000166	0.	....	
20,000	20,000	.000600	.000167	0.	....	
25,000	25,000	.000767	.000167	.000017	.000017	
30,000	30,000	.000950	.000183	.000033	.000016	
31,000	31,000	.000967	.000017	....	....	
32,000	32,000	.001000	.000033	....	....	
33,000	33,000	.001033	.000033	....	....	
34,000	34,000	.001067	.000034	....	....	
35,000	35,000	.001083	.000016	.000067	.000034	
36,000	36,000	.001100	.000017	....	....	
37,000	37,000	.001133	.000033	....	....	
38,000	38,000	.001167	.000034	....	....	
39,000	39,000	.001200	.000033	....	....	
40,000	40,000	.001233	.000033	.000083	.000016	
41,000	41,000	.001300	.000067	....	....	
42,000	42,000	.001333	.000033	....	....	
43,000	43,000	.001367	.000034	....	....	
44,000	44,000	.001400	.000033	....	....	
45,000	45,000	.001433	.000033	.000083	0.	
46,000	46,000	.001467	.000034	....	....	
47,000	47,000	.001500	.000033	....	....	
48,000	48,000	.001533	.000033	....	....	
49,000	49,000	.001567	.000034	....	....	
50,000	50,000	.001600	.000033	.000083	0.	Perceptible deflection.
51,000	51,000	.001617	.000017	....	....	
52,000	52,000	.001650	.000033	....	....	
53,000	53,000	.001683	.000033	....	....	
54,000	54,000	.001717	.000034	....	....	
55,000	55,000	.001733	.000016	.000083	0.	
56,000	56,000	.001767	.000034	....	....	
57,000	57,000	.001800	.000033	....	....	
58,000	58,000	.001833	.000033	....	....	
59,000	59,000	.001883	.000050	....	....	
60,000	60,000	.001917	.000034	.000100	.000017	
61,000	61,000	.002033	.000116	....	....	
62,000	62,000	.002117	.000084	....	....	
63,000	63,000	.002233	.000116	....	....	
64,000	64,000	.002383	.000150	....	....	
65,000	65,000	.002533	.000150	.000550	.000450	
66,000	66,000	.002767	.000234	....	....	
67,000	67,000	.003067	.000300	....	....	
68,000	68,000	.003567	.000500	....	....	
69,000	69,000	.004183	.000616	....	....	
70,000	70,000	.004850	.000667	.002583	.002033	
86,400	86,400	....	....	....	....	Ultimate strength.

General summary.

Elastic limit, pounds, per square inch of original section	not well defined
Ultimate strength per square inch of original section ......pounds..	86,400
Manner of failure	triple flexure
Maximum deflection after the test ......inch..	.25

8" Steel B.L. Rifle.

Hoop B3



S Ex 36 49 1

No. 339.

Tension Test.

Marks on bar, $\overset{\text{R B}_3}{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000116	.000116	0.	....	
2,500	10,000	.000283	.000167	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001066	.000166	0.	....	
10,000	40,000	.001233	.000167	0.	....	
10,250	41,000	.001233	0.	....	....	
10,500	42,000	.001266	.000033	....	....	
10,750	43,000	.001300	.000034	....	....	
11,000	44,000	.001350	.000050	....	....	
11,250	45,000	.001383	.000033	.000016	.000016	
11,500	46,000	.001416	.000033	....	....	
11,750	47,000	.001450	.000034	....	....	
12,000	48,000	.001483	.000033	....	....	
12,250	49,000	.001516	.000033	....	....	
12,500	50,000	.001550	.000034	.000033	.000017	
12,750	51,000	.001566	.000016	....	....	
13,000	52,000	.001600	.000034	....	....	
13,250	53,000	.001633	.000033	....	....	
13,500	54,000	.001666	.000033	....	....	
13,750	55,000	.001700	.000034	.000033	0.	
14,000	56,000	.001750	.000050	....	....	
14,250	57,000	.001783	.000033	....	....	
14,500	58,000	.001816	.000033	....	....	
14,750	59,000	.001850	.000034	....	....	
15,000	60,000	.001883	.000033	.000050	.000017	
15,250	61,000	.001916	.000033	....	....	
15,500	62,000	.001950	.000034	....	....	
15,750	63,000	.001983	.000032	....	....	
16,000	64,000	.002050	.000067	....	....	
16,250	65,000	.002083	.000033	.000050	0.	
16,500	66,000	.002116	.000033	....	....	
16,750	67,000	.002150	.000034	....	....	Elastic limit.
17,000	68,000	.002216	.000066	....	....	
17,250	69,000	.002283	.000067	....	....	
17,500	70,000	.002383	.000100	.000166	.000116	
17,750	71,000	.002483	.000100	....	....	
18,000	72,000	.002633	.000150	....	....	
18,250	73,000	.002966	.000333	....	....	
18,500	74,000	.003533	.000567	....	....	
18,750	75,000	.003966	.000433	.001466	.001300	
19,000	76,000	.004666	.000700	....	....	
19,250	77,000	.005266	.000600	....	....	
19,500	78,000	.006400	.001134	....	....	
19,750	79,000	.007016	.000616	....	....	
20,000	80,000	.008533	.001517	.005566	.004100	
20,500	82,000	.009883	.001350	....	....	
21,000	84,000	.012366	.002483	....	....	
21,500	86,000	.014366	.002000	....	....	
22,000	88,000	.016266	.001900	....	....	
22,500	90,000	.018416	.002150	....	....	
23,000	92,000	.020500	.002084	....	....	
23,500	94,000	.022833	.002333	....	....	
24,000	96,000	.025700	.002867	....	....	
24,500	98,000	.028166	.002466	....	....	
25,000	100,000	.030550	.002384	....	....	
25,500	102,000	.0333	.002750	....	....	
26,000	104,000	.0367	.0034	....	....	
26,500	106,000	.0400	.0033	....	....	
27,000	108,000	.0467	.0067	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
27, 500	110, 000	. 0583	. 0066	....	....	
28, 000	112, 000	. 0650	. 0117	....	....	
28, 400	113, 600	. 0950	. 0300	....	....	Ultimate strength.
24, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8564
Hardness		26. 83
Tensile strength per square inch of original section	pounds..	113, 600
Elastic limit per square inch of original section	do....	67, 000
Elongation per inch after rupture	inch..	0. 1183
Elongation per inch under strain at elastic limit	do....	. 002150
Reduction in diameter at point of rupture	do....	. 124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		".80 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		". 07, ". 07, ". 08, ". 10, ". 12 (".27 fractured section)

No. 340.

Tension Test.

Marks on bar, $^{R\ B_2}_{\ \ \ 2}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000250	.000133	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000567	.000150	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	.000017	.000017	
8,750	35,000	.001083	.000183	.000033	.000016	
10,000	40,000	.001250	.000167	.000050	.000017	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000067	.000050	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001567	.000034	.000067	0.	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001733	.000033	.000083	.000016	
14,000	56,000	.001767	.000034	....	....	
14,250	57,000	.001800	.000033	....	....	
14,500	58,000	.001833	.000033	....	....	
14,750	59,000	.001867	.000034	....	....	
15,000	60,000	.001933	.000066	.000117	.000034	
15,250	61,000	.001983	.000050	....	....	
15,500	62,000	.002017	.000034	....	....	Elastic limit.
15,750	63,000	.002067	.000050	....	....	
16,000	64,000	002133	.000066	....	....	
16,250	65,000	.002267	.000134	.000250	.000133	
16,500	66,000	.002450	.000183	....	....	
16,750	67,000	.002617	.000167	....	....	
17,000	68,000	.002900	.000283	....	....	
17,250	69,000	.003217	.000317	....	....	
17,500	70,000	.003667	.000450	.001400	.001150	
18,000	72,000	.004733	.001066	....	....	
18,500	74,000	.005850	.001117	....	....	
19,000	76,000	.007833	.001983	....	....	
19,500	78,000	.009817	.001984	....	....	
20,000	80,000	.011617	.001800	....	....	
20,500	82,000	.013350	.001733	....	....	
21,000	84,000	.015333	.001983	....	....	
21,500	86,000	.017433	.002100	....	....	
22,000	88,000	.019833	.002400	....	....	
22,500	90,000	.021667	.001834	....	....	
23,000	92,000	.024483	.002816	....	....	
23,500	94,000	.027050	.002567	....	....	
24,000	96,000	.029483	.002433	....	....	
24,500	98,000	.033350	.002767	....	....	
25,000	100,000	.036983	.003733	....	....	Micometer removed.
25,500	102,000	.0400	.003017	....	....	
26,000	104,000	.0467	.0067	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0600	.0083	....	....	
27,500	110,000	.0833	.0233	....	....	Ultimate strength.
24,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	110.000
Elastic limit per square inch of original section	do	62,000
Elongation per inch after rupture	inch..	0.11
Elongation per inch under strain at elastic limit	do	.002017
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.20 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		″.05, ″.06, ″.07, ″.16 (″.23 fractured section), ″.09

No. 349.

Tension Test.

Marks on bar, $^{\text{R B}_3}_{8}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000066	.000066	0.	....	
2,500	10,000	.000200	.000134	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000533	.000200	0.	....	
6,250	25,000	.000733	.000200	0.	....	
7,500	30,000	.000866	.000133	0.	....	
8,750	35,000	.001066	.000200	0.	....	
10,000	40,000	.001200	.000134	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001266	.000033	....	....	
10,750	43,000	.001266	0.	....	....	
11,000	44,000	.001300	.000034	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001400	.000067	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001433	0.	....	....	
12,250	49,000	.001466	.000033	....	....	
12,500	50,000	.001500	.000034	.000033	.000033	
12,750	51,000	.001533	.000033	....	....	
13,000	52,000	.001566	.000033	....	....	
13,250	53,000	.001600	.000034	....	....	
13,500	54,000	.001633	.000033	....	....	
13,750	55,000	.001700	.000067	.000066	.000033	
14,000	56,000	.001766	.000066	....	....	
14,250	57,000	.001800	.000034	....	....	
14,500	58,000	.001833	.000033	....	....	
14,750	59,000	.001866	.000033	....	....	
15,000	60,000	.001900	.000034	.000066	0.	
15,250	61,000	.001933	.000033	....	....	
15,500	62,000	.002033	.000100	....	....	
15,750	63,000	.002066	.000033	....	....	
16,000	64,000	.002100	.000034	....	....	
16,250	65,000	.002166	.000066	.000100	.000034	Elastic limit.
16,500	66,000	.002300	.000134	....	....	
16,750	67,000	.002466	.000166	....	....	
17,000	68,000	.002766	.000300	....	....	
17,250	69,000	.003066	.000300	....	....	
17,500	70,000	.003800	.000734	.001366	.001266	
18,000	72,000	.005033	.001233	....	....	
18,500	74,000	.007066	.002033	....	....	
19,000	76,000	.008700	.001634	....	....	
19,500	78,000	.010633	.001933	....	....	
20,000	80,000	.012300	.001667	....	....	
20,500	82,000	.014233	.001933	....	....	
20,000	84,000	.016300	.002067	....	....	
21,500	86,000	.018333	.002033	....	....	
22,000	88,000	.021033	.002700	....	....	
22,500	90,000	022900	.001867	....	....	
23,000	92,000	.025700	.002800	....	....	
23,500	94,000	.028866	.003166	....	....	
24,000	96,000	.032000	.003134	....	....	
24,500	98,000	.035366	.003366	....	....	
25,000	100,000	.038800	.003434	....	....	Micrometer removed.
25,500	102,000	.0467	.0079	....	....	
26,000	104,000	.0500	.0033	....	....	
26,500	106,000	.0566	.0066	....	....	
27,000	108,000	.0733	.0167	....	....	
27,230	108,920	.1000	.0267	....	....	Ultimate strength.
24,250	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	108,920
Elastic limit per square inch of original section	do	65,000
Elongation per inch after rupture	inch..	0.1667
Elongation per inch under strain at elastic limit	do	.002166
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.85 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections,		″.09, ″.14 (″.27 fractured section)

No. 350.

Tension Test.

Marks on bar, $^{\text{R. B.}}_{\ \ 4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000500	.000167	0.	....	
6,250	25,000	.000666	.000166	0.	....	
7,500	30,000	.000833	.000167	0.	....	
8,750	35,000	.001000	.000167	0.	....	
10,000	40,000	.001166	.000166	0.	....	
10,250	41,000	.001200	.000034	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001266	.000033	....	....	
11,000	44,000	.001300	.000034	....	....	
11,250	45,000	.001300	0.	0.	....	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001366	.000033	....	....	
12,000	48,000	.001400	.000034	....	....	
12,250	49,000	.001433	.000033	....	....	
12,500	50,000	.001466	.000033	0.	....	
12,750	51,000	.001500	.000034	....	....	
13,000	52,000	.001533	.000033	....	....	
13,250	53,000	.001566	.000033	....	....	
13,500	54,000	.001633	.000067	....	....	
13,750	55,000	.001633	0.	.000033	.000033	
14,000	56,000	.001666	.000033	....	....	
14,250	57,000	.001766	.000100	....	....	
14,500	58,000	.001766	0.	....	....	
14,750	59,000	.001800	.000034	....	....	
15,000	60,000	.001833	.000033	.000033	0.	
15,250	61,000	.001866	.000033	....	....	
15,500	62,000	.001900	.000034	....	....	
15,750	63,000	.001933	.000033	....	....	
16,000	64,000	.001966	.000033	....	....	
16,250	65,000	.002000	.000034	.000033	0.	
16,500	66,000	.002066	.000066	....	....	
16,750	67,000	.002100	.000034	....	....	
17,000	68,000	.002200	.000100	....	....	
17,250	69,000	.002233	.000033	....	....	
17,500	70,000	.002300	.000067	.000133	.000100	Elastic limit.
17,750	71,000	.002533	.000233	....	....	
18,000	72,000	.002766	.000233	....	....	
18,250	73,000	.003100	.000334	....	....	
18,500	74,000	.003566	.000466	....	....	
18,750	75,000	.004433	.000867	....	....	
19,000	76,000	.005433	.001000	....	....	
19,500	78,000	.007266	.001833	....	....	
20,000	80,000	.009333	.002067	....	....	
20,500	82,000	.011466	.002133	....	....	
21,000	84,000	.013333	.001867	....	....	
21,500	86,000	.015733	.002400	....	....	
22,000	88,000	.017433	.001700	....	....	
22,500	90,000	.019700	.002267	....	....	
23,000	92,000	.022000	.002300	....	....	
23,500	94,000	.024666	.002666	....	....	
24,000	96,000	.027333	.002667	....	....	
24,500	98,000	.030500	.003167	....	....	
25,000	100,000	.033733	.003233	....	....	
25,500	102,000	.037333	.003600	....	....	
26,000	104,000	.041933	.004600	....	....	
26,500	106,000	.047366	.005433	....	....	

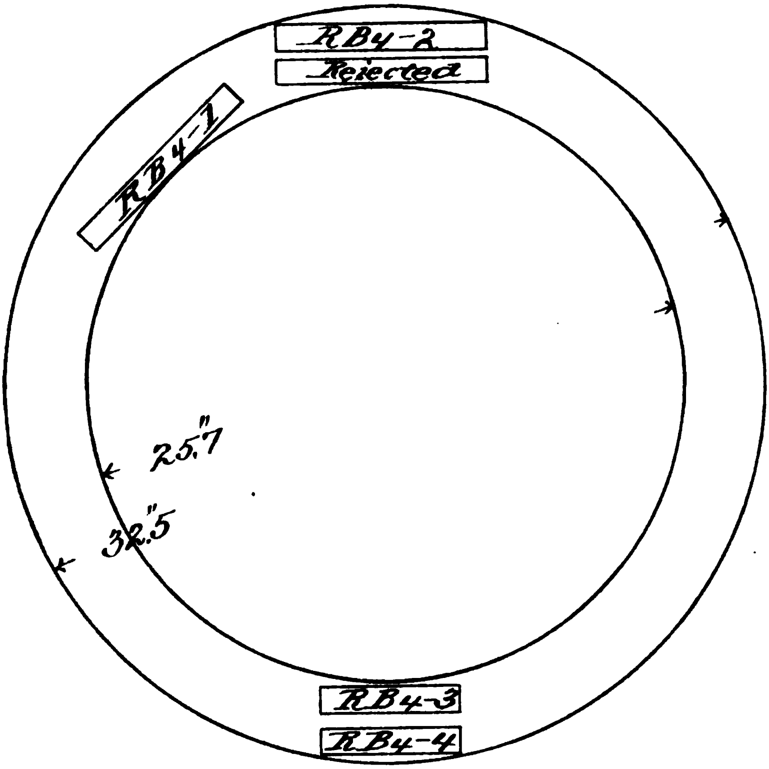
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
27,000	108,000	.0533	.005934	....	....	
27,500	110,000	.0667	.0134	....	....	
27,790	111,160	.1300	.0633	....	....	Ultimate strength.
24,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	111,160
Elastic limit per square inch of original section	do....	70,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.002300
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		".65 from neck
Character of broken service		fine granular, dull, smoky center
Elongation of inch sections		".09, ".09 (".27 fractured section)

8" Steel B. L. Rifle

Hoop B 4



S Ex 36 49 1

No. 330.

Tension Test.

Marks on bar, $^{\mathrm{R\,B}}_{1}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000450	.000133	0.	....	
5,000	20,000	.000567	.000117	0	....	
6,250	25,000	.000733	.000166	.000017	.000017	
7,500	30,000	.000900	.000167	.000017	0.	
8,750	35,000	.001083	.000183	.000017	0.	
10,000	40,000	.001250	.000167	.000017	0.	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001367	.000067	....	....	
11,000	44,000	.001383	.000016	....	....	
11,250	45,000	.001417	.000034	.000050	.000033	
11,500	46,000	.001467	.000050	....	....	
11,750	47,000	.001483	.000016	....	....	
12,000	48,000	.001500	.000017	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001600	.000067	.000067	.000017	
12,750	51,000	.001617	.000017	....	....	
13,000	52,000	.001650	.000033	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001717	.000034	....	....	
13,750	55,000	.001750	.000033	.000083	.000016	
14,000	56,000	.001833	.000083	....	....	
14,250	57,000	.001867	.000034	....	....	
14,500	58,000	.001900	.000033	....	....	
14,750	59,000	.001917	.000017	....	....	Elastic limit.
15,000	60,000	.002000	.000083	.000167	.000084	
15,250	61,000	.002083	.000083	....	....	
15,500	62,000	.002250	.000167	....	....	
15,750	63,000	.002417	.000167	....	....	
16,000	64,000	.002833	.000416	....	....	
16,250	65,000	.003283	.000450	.001117	.000950	
16,500	66,000	.003900	.000617	....	....	
16,750	67,000	.004783	.000883	....	....	
17,000	68,000	.005783	.001000	....	....	
17,250	69,000	.006700	.000917	....	....	
17,500	70,000	.008033	.001333	.005417	.004300	
18,000	72,000	.009317	.001284	....	....	
18,500	74,000	.012083	.002766	....	....	
19,000	76,000	.013867	.001784	....	....	
19,500	78,000	.015867	.002000	....	....	
20,000	80,000	.018433	.002566	....	....	
20,500	82,000	.020800	.002367	....	....	
21,000	84,000	.023400	.002600	....	....	
21,500	86,000	.025933	.002533	....	....	
22,000	88,000	.028633	.002700	....	....	
22,500	90,000	.032200	.003567	....	....	
23,000	92,000	.035700	.003500	....	....	Micrometer removed.
23,500	94,000	.0400	.0043	....	....	
24,000	96,000	.0433	.0033	....	....	
24,500	98,000	.0517	.0084	....	....	
25,000	100,000	.0617	.0100	....	....	
25,500	102,000	.0800	.0183	....	....	
25,720	102,880	.1050	.0250	....	....	Ultimate strength.
21,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 102,880
Elastic limit per square inch of original section .... do ... 59,000
Elongation per inch after rupture .... inch.. 0.1400
Elongation per inch under strain at elastic limit .... do ... .001917
Reduction in diameter at point of rupture .... do.... .154
Reduction in area after rupture, per centum of original section 47.2
Position of rupture .... ".40 from middle of stem
Character of broken surface .... fine granular, 60 per cent.; dull, smoky spot, 40 per cent.
Elongation of inch sections .... ".07, ".05, ".10 (".34 fractured section), ".12, ".18

No. 331.

Tension Test.

Marks on bar, $^{\text{R B}_4}_{\ 2}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000233	.000150	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.001067	.000234	0.	....	
10,000	40,000	.001183	.000116	.000017	.000017	
10,250	41,000	.001183	0.	....	....	
10,500	42,000	.001233	.000050	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	.000017	0.	
11,500	46,000	.001350	.000017	....	....	
11,750	47,000	.001400	.000050	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001500	.000033	.000033	.000016	
12,750	51,000	.001533	.000033	....	....	
13,000	52,000	.001567	.000034	....	....	
13,250	53,000	.001600	.000033	....	....	
13,500	54,000	.001633	.000033	....	....	
13,750	55,000	.001667	.000034	.000050	.000017	
14,000	56,000	.001733	.000066	....	....	
14,250	57,000	.001767	.000034	....	....	
14,500	58,000	.001800	.000033	....	....	
14,750	59,000	.001850	.000050	....	....	Elastic limit.
15,000	60,000	.001917	.000067	.000083	.000033	
15,250	61,000	.002000	.000083	....	....	
15,500	62,000	.002083	.000083	....	....	
15,750	63,000	.002250	.000167	....	....	
16,000	64,000	.002417	.000167	....	....	
16,250	65,000	.002833	.000416	.000717	.000634	
16,500	66,000	.003200	.000367	....	....	
16,750	67,000	.004050	.000850	....	....	
17,000	68,000	.005217	.001167	....	....	
17,250	69,000	.005967	.000750	....	....	
17,500	70,000	.007300	.001333	.004767	.004050	
18,000	72,000	.008717	.001417	....	....	
18,500	74,000	.011017	.002300	....	....	
19,000	76,000	.012917	.001900	....	....	
19,500	78,000	.014933	.002016	....	....	
20,000	80,000	.017133	.002200	....	....	
20,500	82,000	.019467	.002334	....	....	
21,000	84,000	.021833	.002366	....	....	
21,500	86,000	.024083	.002250	....	....	
22,000	88,000	.027367	.003284	....	....	
22,500	90,000	.029500	.002133	....	....	
23,000	92,000	.033333	.003833	....	....	
23,500	94,000	.036667	.003334	....	....	
24,000	96,000	.041200	.004533	....	....	
24,500	98,000	.046867	.005667	....	....	
25,000	100,000	.053533	.006666	....	....	Micrometer removed.
25,500	102,000	.0667	.013167	....	....	
26,000	104,000	.0867	.0200	....	....	
26,110	104,440	.1050	.0183	....	....	Ultimate strength.
22,550	.....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8581
Hardness		22.90
Tensile strength per square inch of original section	pounds..	104,440
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch .	0.1317
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.30 from middle of stem
Character of broken surface		fine granular, with a small dull spot near the center
Elongation of inch sections		″.08, ″.12 (″.28 fractured section), ″.13, ″.10, ″.02

No. 328.

Tension Test.

Marks on bar, $^{\text{R B}_4}_{\ \ 3}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000500	.000133	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000767	.000100	0.	....	
8,750	35,000	.000967	.000200	0.	....	
10,000	40,000	.001100	.000133	0.	....	
10,250	41,000	.001133	.000033	....	....	
10,500	42,000	.001200	.000067	....	....	
10,750	43,000	.001233	.000033	....	....	
11,000	44,000	.001267	.000034	....	....	
11,250	45,000	.001300	.000033	0.	....	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001333	0.	....	....	
12,000	48,000	.001367	.000034	....	....	
12,250	49,000	.001400	.000033	....	....	
12,500	50,000	.001433	.000033	0.	....	
12,750	51,000	.001433	0.	....	....	
13,000	52,000	.001467	.000034	....	....	
13,250	53,000	.001500	.000033	....	....	
13,500	54,000	.001567	.000067	....	....	
13,750	55,000	.001633	.000066	.000033	.000033	
14,000	56,000	.001667	.000034	....	....	
14,250	57,000	.001700	.000033	....	....	Elastic limit.
14,500	58,000	.001800	.000100	....	....	
14,750	59,000	.001967	.000167	....	....	
15,000	60,000	.002233	.000266	.000367	.000334	
15,250	61,000	.002533	.000300	....	....	
15,500	62,000	.003033	.000500	....	....	
15,750	63,000	.004033	.001000	....	....	
16,000	64,000	.004733	.000700	....	....	
16,250	65,000	.005433	.000700	.003133	.002766	
16,500	66,000	.006067	.000634	....	....	
16,750	67,000	.007033	.000966	....	....	
17,000	68,000	.007933	.000900	....	....	
17,250	69,000	.008967	.001034	....	....	
17,500	70,000	.010267	.001300	.007600	.004467	
18,000	72,000	.011533	.001266	....	....	
18,500	74,000	.013533	.002000	....	....	
19,000	76,000	.015733	.002200	....	....	
19,500	78,000	.017967	.002234	....	....	
20,000	80,000	.019900	.001933	....	....	
20,500	82,000	.022633	.002733	....	....	
21,000	84,000	.025233	.002600	....	....	
21,500	86,000	.027733	.002500	....	....	
22,000	88,000	.031133	.003400	....	....	
22,500	90,000	.034633	.003500	....	....	
23,000	92,000	.038367	.003734	....	....	
23,500	94,000	.043667	.005300	....	....	
24,000	96,000	.049467	.005800	....	....	
24,500	98,000	.055400	.005933	....	....	
25,000	100,000	.066867	.011467	....	....	Micrometer removed.
25,500	102,000	.0883	.021433	....	....	
25,740	102,960	.1200	.0317	....	....	Ultimate strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,960
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1933
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do ..	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.65 from neck
Character of broken surface		fine granular, 60 per cent.; dull smoky center, 40 per cent.
Elongation of inch sections		″.15, ″.13 (″.30 fractured section)

No. 329.

Tension Test.

Marks on bar, $^{\text{R B}_4}_{4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000867	.000134	0.	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001200	.000167	.000033	....	
10,250	41,000	.001200	0.	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	.000067	.000034	
11,500	46,000	.001400	.000067	....	....	
11,750	47,000	.001467	.000067	....	....	
12,000	48,000	.001467	0.	....	....	
12,250	49,000	.001500	.000033	....	....	
12,500	50,000	.001567	.000067	.000100	.000033	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001667	.000067	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001767	.000067	....	....	Elastic limit.
13,750	55,000	.001867	.000100	.000200	.000100	
14,000	56,000	.002000	.000133	....	....	
14,250	57,000	.002133	.000133	....	....	
14,500	58,000	.002467	.000334	....	....	
14,750	59,000	.002800	.000333	....	....	
15,000	60,000	.003433	.000633	.001467	.001267	
15,250	61,000	.004033	.000600	....	....	
15,500	62,000	.005200	.001167	....	....	
15,750	63,000	.005600	.000400	....	....	
16,000	64,000	.006467	.000867	....	....	
16,250	65,000	.007533	.001066	.005200	.003733	
16,500	66,000	.008333	.000800	....	....	
16,750	67,000	.009200	.000867	....	....	
17,000	68,000	.010267	.001067	....	....	
17,250	69,000	.011100	.000833	....	....	
17,500	70,000	.012233	.001133	.009633	.004433	
18,000	72,000	.013833	.001600	....	....	
18,500	74,000	.016267	.002434	....	....	
19,000	76,000	.018533	.002266	....	....	
19,500	78,000	.020933	.002400	....	....	
20,000	80,000	.023400	.002467	....	....	
20,500	82,000	.026200	.002800	....	....	
21,000	84,000	.028767	.002567	....	....	
21,500	86,000	.032033	.003266	....	....	
22,000	88,000	.035200	.003167	....	....	
22,500	90,000	.038533	.003333	....	....	
23,000	92,000	.044533	.006000	....	....	
23,500	94,000	.050200	.005667	....	....	
24,000	96,000	.058533	.008333	....	....	
24,500	98,000	.070667	.012134	....	....	
25,000	100,000	.092000 .1150	.021333 .0230	....	....	Micrometer removed. Ultimate strength.
21,200	....	....	....	....	....	Load at time of rupture.

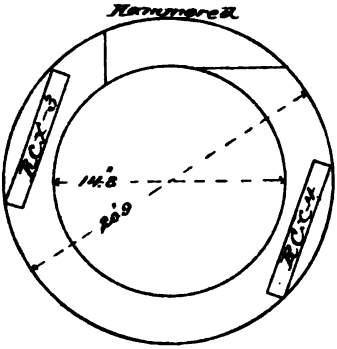
General summary.

Tensile strength per square inch of original section ....pounds.. 100,000
Elastic limit per square inch of original section.... ....do.... 54,000
Elongation per inch after rupture.......... . ...inch.. 0.1767
Elongation per inch under strain at elastic limit ....do.... .001767
Reduction in diameter at point of rupture .... do.... .144
Reduction in area after rupture, per centum of original section 41.6
Position of rupture ....″ 80 from neck
Character of broken surface ....fine granular, 40 per cent; dull smoky center, 60 per cent.
Elongation of inch sections . ...″.09, ″.12 (″.32 fractured section)

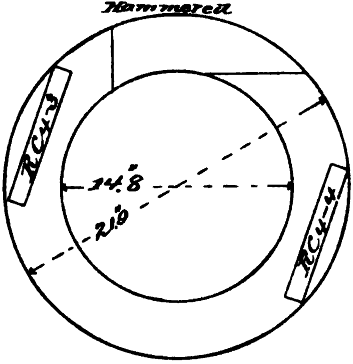
Hoops C4, Cx, Dx

8 inch Rifle

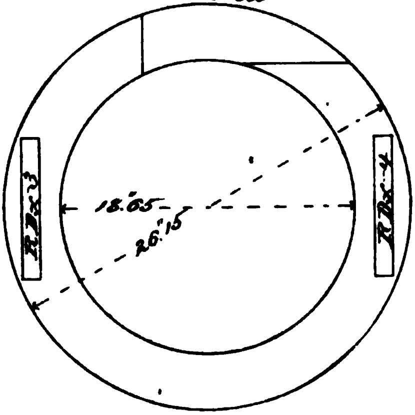
Cx
Hammered



C4
Hammered



Dx
Hammered



No. 342.

Tension Test.

Marks on bar, $^{R\,Cx}_{3}$

Diameter, ''.564.

Sectional area, .25 square inch.

Length, 6''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000300	.000167	0.		
3,750	15,000	.000466	.000166	0.		
5,000	20,000	.000616	.000150	0.		
6,250	25,000	.000733	.000117	0.		
7,500	30,000	.000900	.000167	.000033	.000033	
8,750	35,000	.001083	.000183	.000050	.000017	
10,000	40,000	.001250	.000167	.000050	0.	
10,250	41,000	.001266	.000016			
10,500	42,000	.001316	.000050			
10,750	43,000	.001333	.000017			
11,000	44,000	.001366	.000033			
11,250	45,000	.001400	.000034	.000066	.000016	
11,500	46,000	.001433	.000033			
11,750	47,000	.001466	.000033			
12,000	48,000	.001500	.000034			
12,250	49,000	.001533	.000033			
12,500	50,000	.001583	.000050	.000083	.000017	
12,750	51,000	.001633	.000050			
13,000	52,000	.001666	.000033			
13,250	53,000	.001700	.000034			
13,500	54,000	.001733	.000033			
13,750	55,000	.001766	.000033	.000100	.000017	
14,000	56,000	.001816	.000050			
14,250	57,000	.001850	.000034			
14,500	58,000	.001883	.000033			
14,750	59,000	.001916	.000033			Elastic limit.
15,000	60,000	.002050	.000134	.000150	.000050	
15,250	61,000	.002150	.000100			
15,500	62,000	.002483	.000333			
15,750	63,000	.002866	.000383			
16,000	64,000	.003483	.000617			
16,250	65,000	.004150	.000667	.001883	.001733	
16,500	66,000	.004733	.000583			
16,750	67,000	.005150	.000417			
17,000	68,000	.005900	.000750			
17,250	69,000	.006483	.000583			
17,500	70,000	.007633	.001150	.005017	.003134	
18,000	72,000	.008733	.001100			
18,500	74,000	.010400	.001667			
19,000	76,000	.012116	.001716			
19,500	78,000	.013416	.001300			
20,000	80,000	.015266	.001850			
20,500	82,000	.017083	.001817			
21,000	84,000	.018516	.001433			
21,500	86,000	.020350	.002034			
22,000	88,000	.022700	.002150			
22,500	90,000	.024983	.002283			
23,000	92,000	.027383	.002400			
23,500	94,000	.029833	.002450			
24,000	96,000	.032483	.002650			
24,500	98,000	.036666	.004183			
25,000	100,000	.040000	.003334			Micrometer removed.
25,500	102,000	.0433	.0033			
26,000	104,000	.0500	.0067			
26,500	106,000	.0550	.0050			
27,000	108,000	.0667	.0117			
27,450	109,800	.0916	.0249			Ultimate strength.
24,400						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	109,800
Elastic limit per square inch of original section	do	59,000
Elongation per inch after rupture	inch	0.12
Elongation per inch under strain at elastic limit	do	.001916
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		''.85 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		''.08, ''.08, ''.07, ''.09, ''.14 (''.26 fractured section)

No. 382.

Compression Test.

Marks on bar, $^{\text{R C}_{2}}_{\;\;4}$
Length, 8″.96.
Diameter, 1″.132.
Sectional area, 1.007 square inches.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1, 007	1, 000	0.	0.	0.	0.	Initial load.
5, 035	5, 000	.000117	.000117	0.	....	
10, 070	10, 000	.000250	.000133	0.	....	
15, 105	15, 000	.000400	.000150	0.	....	
20, 140	20, 000	.000550	.000150	0.	....	
25, 175	25, 000	.000733	.000183	0.	....	
30, 210	30, 000	.000883	.000150	0.	....	
31, 217	31, 000	.000950	.000067	....	....	
32, 224	32, 000	.000983	.000033	....	....	
33, 231	33, 000	.001017	.000034	....	....	
34, 238	34, 000	.001050	.000033	....	....	
35, 245	35, 000	.001083	.000033	.000017	.000017	Perceptible deflection.
36, 252	36, 000	.001117	.000034	....	....	
37, 259	37, 000	.001150	.000033	....	....	
38, 266	38, 000	.001183	.000033	....	....	
39, 273	39, 000	.001217	.000034	....	....	
40, 280	40, 000	.001250	.000033	.000017	0.	
41, 287	41, 000	.001283	.000033	....	....	
42, 294	42, 000	.001317	.000034	....	....	
43, 301	43, 000	.001350	.000033	....	....	
44, 308	44, 000	.001383	.000033	....	....	
45, 315	45, 000	.001417	.000034	.000017	0.	
46, 322	46, 000	.001467	.000050	....	....	
47, 329	47, 000	.001500	.000033	....	....	
48, 336	48, 000	.001533	.000033	....	....	
49, 343	49, 000	.001567	.000034	....	....	
50, 350	50, 000	.001617	.000050	.000017	0.	
51, 357	51, 000	.001683	.000066	....	....	
52, 364	52, 000	.001700	.000017	....	....	
53, 371	53, 000	.001733	.000033	....	....	
54, 378	54, 000	.001767	.000034	....	....	
55, 385	55, 000	.001800	.000033	.000017	0.	
56, 392	56, 000	.001817	.000017	....	....	
57, 399	57, 000	.001850	.000033	....	....	
58, 406	58, 000	.001883	.000033	....	....	
59, 413	59, 000	.001917	.000034	....	....	
60, 420	60, 000	.001967	.000050	.000050	.000033	Elastic limit.
61, 427	61, 000	.002500	.000533	....	....	
62, 434	62, 000	.003150	.000650	....	....	
63, 441	63, 000	.004017	.000860	....	....	
64, 448	64, 000	.005000	.000983	....	....	
65, 455	65, 000	.000050	.001050	.003700	.003650	
66, 462	66, 000	.007033	.000983	....	....	
67, 469	67, 000	.007767	.000734	....	....	
68, 476	68, 000	.008833	.001066	....	....	
69, 483	69, 000	.010100	.001267	....	....	
70, 490	70, 000	.012017	.001917	.008833	.005133	Test discontinued.

General summary.

Elastic limit per square inch of original section ....pounds.. 60, 000
Compression per inch under stress at elastic limit..inch.. 0. 001967
Permanent deflection at middle.. ".04

No. 341.

Tension Test.

Marks on bar, $^{\mathrm{B\,C_4}}_{\mathrm{8}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000200	.000117	0.	....	
3,750	15,000	.000333	.000133	—.000016	—.000016	
5,000	20,000	.000516	.000183	—.000016	0.	
6,250	25,000	.000633	.000117	—.000016	0.	
7,500	30,000	.000816	.000183	—.000016	0.	
8,750	35,000	.000966	.000150	—.000016	0.	
10,000	40,000	.001150	.000184	—.000016	0.	
10,250	41,000	.001183	.000033	....	....	
10,500	42,000	.001216	.000033	....	....	
10,750	43,000	.001233	.000017	....	....	
11,000	44,000	.001266	.000033	....	....	
11,250	45,000	.001300	.000034	0.	.000016	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001366	.000033	....	....	
12,000	48,000	.001400	.000034	....	....	
12,250	49,000	.001433	.000033	....	....	
12,500	50,000	.001466	.000033	0.	0.	
12,750	51,000	.001500	.000034	....	....	
13,000	52,000	.001533	.000033	....	....	
13,250	53,000	.001566	.000033	....	....	
13,500	54,000	.001600	.000034	....	....	
13,750	55,000	.001633	.000033	0.	0.	
14,000	56,000	.001683	.000050	....	....	
14,250	57,000	.001716	.000033	....	....	
14,500	58,000	.001750	.000034	....	....	
14,750	59,000	.001783	.000033	....	....	
15,000	60,000	.001816	.000033	.000016	.000016	
15,250	61,000	.001850	.000034	....	....	
15,500	62,000	.001900	.000050	....	....	
15,750	63,000	.001950	.000050	....	....	
16,000	64,000	.001983	.000033	....	....	
16,250	65,000	.002016	.000033	.000033	.000017	
16,500	66,000	.002066	.000050	....	....	Elastic limit.
16,750	67,000	.002216	.000150	....	....	
17,000	68,000	.003250	.001034	....	....	
17,250	69,000	.003883	.000633	....	....	
17,500	70,000	.005000	.001117	.002550	.002517	
18,000	72,000	.006050	.001050	....	....	
18,500	74,000	.007383	.001333	....	....	
19,000	76,000	.008633	.001250	....	....	
19,500	78,000	.010133	.001500	....	....	
20,000	80,000	.011583	.001450	....	....	
20,500	82,000	.013150	.001567	....	....	
21,000	84,000	.014750	.001600	....	....	
21,500	86,000	.016416	.001666	....	....	
22,000	88,000	.017250	.000834	....	....	
22,500	90,000	.019883	.002633	....	....	
23,000	92,000	.021966	.002083	....	....	
23,500	94,000	.024250	.002284	....	....	
24,000	96,000	.026333	.002083	....	....	
24,500	98,000	.028916	.002583	....	....	
25,000	100,000	.031466	.002550	....	....	
25,500	102,000	.0333	.001834	....	....	Micrometer removed.
26,000	104,000	.0366	.0033	....	....	
26,500	106,000	.0417	.0051	....	....	
27,000	108,000	.0450	.0033	....	....	
27,500	110,000	.0533	.0083	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pound.	*Pound.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
28,000	112,000	0.0600	0.0067			
28,500	114,000	.0750	.0150			
28,790	115,160	.1017	.0267			Ultimate strength.
25,200						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	115,160
Elastic limit per square inch of original section	do....	66,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.002066
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.10 from neck
Character of broken surface		fine granular, dull, smoky center
Elongation of inch sections		″.09, ″.10, ″.10, ″.19 (″ 24 fractured section), ″.10

No. 381.

Compression Test.

Marks on bar, $^{\mathrm{B}\,\mathrm{C}_4}_{\quad 4}$
Length, 8''.965.
Diameter, 1''.132.
Sectional area, 1.007 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,007	1,000	0.	0.	0.	0.	Initial load.
5,035	5,000	.000150	.000150	0.	....	
10,070	10,000	.000300	.000150	.000033	.000033	
15,105	15,000	.000467	.000167	.000033	0.	
20,140	20,000	.000633	.000166	.000033	0.	
25,175	25,000	.000800	.000167	.000050	.000017	
30,210	30,000	.000983	.000183	.000067	.000017	
31,217	31,000	.001017	.000034	....	....	
32,224	32,000	.001050	.000033	....	....	
33,231	33,000	.001100	.000050	....	....	
34,238	34,000	.001117	.000017	....	....	
35,245	35,000	.001150	.000033	.000067	0.	
36,252	36,000	.001200	.000050	....	....	
37,259	37,000	.001233	.000033	....	....	
38,266	38,000	.001267	.000034	....	....	Perceptible deflection.
39,273	39,000	.001317	.000050	....	....	
40,280	40,000	.001367	.000050	.000083	.000016	
41,287	41,000	.001367	0.	....	....	
42,294	42,000	.001400	.000033	....	....	
43,301	43,000	.001450	.000050	....	....	
44,308	44.000	.001500	.000050	....	....	
45,315	45,000	.001533	.000033	.000083	0.	
46,322	46,000	.001550	.000017	....	....	
47,329	47,000	.001583	.000033	....	....	
48,336	48,000	.001650	.000067	....	....	
49,343	49,000	.001700	.000050	....	....	
50,350	50,000	.001750	.000050	.000083	0.	
51,357	51,000	.001783	.000033	....	....	
52,364	52,000	.001817	.000034	....	....	
53,371	53,000	.001817	0.	....	....	
54,378	54,000	.001867	.000050	....	....	
55,385	55,000	.001900	.000033	.000100	.000017	
56,392	56,000	.001933	.000033	....	....	
57,399	57,000	.001967	.000034	....	....	
58,406	58,000	.002000	.000033	....	....	
59,413	59,000	.002050	.000050	....	....	
60,420	60,000	.002100	.000050	.000117	.000017	Elastic limit.
61,427	61,000	.002183	.000083	....	....	
62,434	62,000	.002217	.000034	....	....	
63,441	63,000	.002283	.000066	....	....	
64,448	64,000	.002367	.000084	....	....	
65,455	65,000	.002500	.000133	.000267	.000150	
66,462	66,000	.002700	.000200	....	....	
67,469	67,000	.003033	.000333	....	....	
68,476	68,000	.003967	.000934	....	....	
69,483	69,000	.004667	.000700	....	....	
70,490	70,000	.006200	.001533	.003600	.003333	Test discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	60,000
Compression per inch under stress at elastic limit	inch..	0.002100

The deflection of the bar observed under 38,000 pounds per square inch increased as the pressure was increased, but nearly recovered its straightness when the loads were released, till a pressure exceeding 60,000 pounds per square inch had been applied.

The permanent deflection at the middle at the close of the test was''.03.

No. 343.

Tension Test.

Marks on bar, $^{R}\underset{3}{D_{2}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000416	.000166	0.	....	
5,000	20,000	.000566	.000150	0.	....	
6,250	25,000	.000700	.000134	0.	....	
7,500	30,000	.000866	.000166	0.	....	
8,750	35,000	.001133	.000267	0.	....	
10,000	40,000	.001200	.000067	.000016	.000016	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001266	.000033	....	....	
10,750	43,000	.001300	.000034	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001366	.000033	.000050	.000034	
11,500	46,000	.001416	.000050	....	....	
11,750	47,000	.001450	.000034	....	....	
12,000	48,000	.001483	.000033	....	....	
12,250	49,000	.001516	.000033	....	....	
12,500	50,000	.001550	.000034	.000050	0.	
12,750	51,000	.001583	.000033	....	....	
13,000	52,000	.001616	.000033	....	....	
13,250	53,000	.001633	.000017	....	....	
13,500	54,000	.001666	.000033	....	....	
13,750	55,000	.001700	.000034	.000050	0.	
14,000	56,000	.001750	.000050	....	....	
14,250	57,000	.001783	.000033	....	....	
14,500	58,000	.001816	.000033	....	....	
14,750	59,000	.001850	.000034	....	....	
15,000	60,000	.001883	.000033	.000066	.000016	Elastic limit.
15,250	61,000	.001983	.000100	....	....	
15,500	62,000	.002016	.000033	....	....	
15,750	63,000	.002083	.000067	....	....	
16,000	64,000	.003133	.001050	....	....	
16;250	65,000	.003700	.000567	.001500	.001434	
16,500	66,000	.004433	.000733	....	....	
16,750	67,000	.003833	.001400	....	....	
17,000	68,000	.005883	.002050	....	....	
17,250	69,000	.006333	.000450	....	....	
17,500	70,000	.006983	.000650	.004500	.003000	
18,000	72,000	.008300	.001317	....	....	
18,500	74,000	.009833	.001533	....	....	
19,000	76,000	.011616	.001783	....	....	
19,500	78,000	.013083	.001467	....	....	
20,000	80,000	.014783	.001700	....	....	
20,500	82,000	.016250	.001467	....	....	
21,000	84,000	.017950	.001700	....	....	
21,500	86,000	.019800	.001850	....	....	
22,000	88,000	.021700	.001900	....	....	
22,500	90,000	.023783	.002083	....	....	
23,000	92,000	.025950	.002167	....	....	
23,500	94,000	.028500	.002550	....	....	
24,000	96,000	.031166	.002666	....	....	
24,500	98,000	.034783	.003617	....	....	
25,000	100,000	.038333	.003550	....	....	Micrometer removed.
25,500	102,000	.0417	.003367	....	....	
26,000	104,000	.0467	.0050	....	....	
26,500	106,000	.0517	.0050	....	....	
27,000	108,000	.0600	.0083	....	....	
27,500	110,000	.0733	.0133	....	....	
27.900	111,600	.1067	.0334	....	....	Ultimate strength.
24,951	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	111,600
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.50 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		″.09, ″.10, ″.13, ″.14 (″.30 fractured section), ″.12

No. 344.

Tension Test.

Marks on bar, $^{\text{R}}\,{}^{\text{D}_x}_{4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000116	.000116	0.	....	
2,500	10,000	.000283	.000167	0.	....	
3,750	15,000	.000433	.000150	.000016	.000016	
5,000	20,000	.000583	.000150	.000016	0.	
6,250	25,000	.000733	.000150	.000033	.000017	
7,500	30,000	.000916	.000183	.000050	.000017	
8,750	35,000	.001083	.000167	.000066	.000016	
10,000	40,000	.001250	.000167	.000066	0.	
10,250	41,000	.001266	.000016	....	....	
10,500	42,000	.001300	.000034	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001366	.000033	....	....	
11,250	45,000	.001400	.000034	.000066	0.	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001466	.000033	....	....	
12,000	48,000	.001516	.000050	....	....	
12,250	49,000	.001550	.000034	....	....	
12,500	50,000	.001583	.000033	.000100	.000034	
12,750	51,000	.001616	.000033	....	....	
13,000	52,000	.001650	.000034	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001716	.000033	....	....	
13,750	55,000	.001750	.000034	.000100	0.	
14,000	56,000	.001816	.000066	....	....	
14,250	57,000	.001850	.000034	....	....	
14,500	58,000	.001883	.000033	....	....	
14,750	59,000	.001916	.000033	....	....	
15,000	60,000	.001950	.000034	.000116	.000016	
15,250	61,000	.001983	.000033	....	....	
15,500	62,000	.002033	.000050	....	....	
15,750	63,000	.002066	.000033	....	....	
16,000	64,000	.002116	.000050	....	....	Elastic limit.
16,250	65,000	.002216	.000100	.000200	.000084	
16,500	66,000	.002450	.000234	....	....	
16,750	67,000	.002950	.000500	....	....	
17,000	68,000	.003616	.000666	....	....	
17,250	69,000	.004233	.000617	....	....	
17,500	70,000	.005116	.000883	....	....	
18,000	72,000	.006300	.001184	....	....	
18,500	74,000	.007833	.001533	....	....	
19,000	76,000	.009683	.001850	....	....	
19,500	78,000	.010783	.001100	....	....	
20,000	80,000	.012466	.001683	....	....	
20,500	82,000	.013983	.001517	....	....	
21,000	84,000	.015633	.001650	....	....	
21,500	86,000	.017166	.001533	....	....	
22,000	88,000	.019500	.002334	....	....	
22,500	90,000	.021333	.001833	....	....	
23,000	92,000	.023166	.001833	....	....	
23,500	94,000	.025333	.002167	....	....	
24,000	96,000	.027866	.002533	....	....	
24,500	98,000	.030800	.002934	....	....	
25,000	100,000	.033800	.003000	....	....	Micrometer removed.
25,500	102,000	.0383	.0045	....	....	
26,000	104,000	.0417	.0034	....	....	
26,500	106,000	.0483	.0066	....	....	
27,000	108,000	.0517	.0034	....	....	
27,500	110,000	.0617	.0100	....	....	
28,000	112,000	.0733	.0116	....	....	
28,360	113,440	.0950	.0217	....	....	Ultimate strength.
25,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	113,440
Elastic limit per square inch of original section	do ...	64,000
Elongation per inch after rupture	inch..	0.1183
Elongation per inch under strain at elastic limit	do....	.002116
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		30.4
Position of rupture		1″.45 from neck
Character of broken surface		fine granular, dull smoky center
Elongation of inch sections		″.08, ″.08, ″.09, ″.10 (″.26 fractured sections), ″.10

No. 332.

Tension Test.

[Trunnion hoop 8″ steel, B. L. Rifle.]

Marks on bar, $^{8\text{ in R}}_{1972}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000233	.000150	0.	....	
3,750	15,000	.000383	.000150	0.	....	
5,000	20,000	.000550	.000167	0.	....	
6,250	25,000	.000800	.000250	.000116	.000116	
6,500	26,000	000833	.000033	....	....	
6,750	27,000	.000883	.000050	....	....	
7,000	28,000	.000966	.000083	....	....	
7,250	29,000	.001050	.000084	....	....	
7.500	30,000	.001100	.000050	.000233	.000117	
7,750	31,000	.001166	.000066	....	....	
8,000	32,000	.001233	.000067	....	....	
8,250	33,000	.001300	.000067	....	....	
8,500	34,000	.001400	.000100	....	....	
8,750	35,000	.001433	.000033	.000416	.000183	
9,000	36,000	.001483	.000050	....	....	
9,250	37,000	.001550	.000067	....	....	
9,500	38,000	.001650	.000100	....	....	
9,750	39,000	.001716	.000066	....	....	Probable elastic limit.
10,000	40,000	.001866	.000150	.000600	.000184	
10,250	41,000	.001966	.000100	....	....	
10,500	42,000	.002066	.000100	....	....	
10,750	43,000	.002166	.000100	....	....	
11,000	44,000	.002400	.000234	....	....	
11,250	45,000	.002600	.000200	.001150	.000550	
11,500	46,000	.002866	.000266	....	....	
11,750	47,000	.003066	.000200	....	....	
12,000	48,000	.003533	.000467	....	....	
12,250	49,000	.003983	.000450	....	....	
12,500	50,000	.004750	.000767	.003016	.001866	
12,750	51,000	.005033	.000283	....	....	
13,000	52,000	.005700	.000667	....	....	
13,250	53,000	.006283	.000583	....	....	
13,500	54,000	.007000	.000717	....	....	
13,750	55,000	.007550	.000550	.005533	.002517	
14,000	56,000	.008266	.000716	....	....	
14,250	57,000	.008900	.000634	....	....	
14,500	58,000	.009750	.000850	....	....	
14,750	59,000	.010650	.000900	....	....	
15,000	60,000	.011716	.001066	.009400	.003867	
15,500	62,000	.013150	.001434	....	....	
16,000	64,000	.015166	.002016	....	....	
16,500	66,000	.017866	.002700	....	....	
17,000	68,000	.020100	.002234	....	....	
17,500	70,000	.022433	.002333	....	....	
18,000	72,000	.024883	.002450	....	....	
18,500	74,000	.027650	.002767	....	....	
19,000	76,000	.031650	.004000	....	....	Micrometer removed.
19,500	78,000	.0350	.003350	....	....	
20,000	80,000	.0383	.0033	....	....	
20,500	82,000	.0450	.0067	....	....	
21,000	84,000	.0517	.0067	....	....	
21,500	86,000	.0583	.0066	....	....	
22,000	88,000	.0667	.0084	....	....	
22,500	90,000	.0833	.0166	....	....	
23,000	92,000	.1150	.0317	....	....	
23,030	92,120	.1283	.0133	....	....	Ultimate strength.
19,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	92,120
Elastic limit per square inch of original section	do ...	39,000
Elongation per inch after rupture	inch..	0.17
Elongation per inch under strain at elastic limit	do....	.001716
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.75 from neck
Character of broken surface		fine silky; cup-shaped ends
Elongation of inch sections		″.07, ″.11, ″.11, ″.14, ″.18 (″.41 fractured section)

No. 333.

Tension Test.

[Trunnion hoops, 8″ steel B. L. Rifle.]

Marks on bar, 8 in R 1972.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000083	.000083	0.	....	
2, 500	10, 000	.000250	.000167	0.	....	
3, 750	15, 000	.000416	.000166	0.	....	
5, 000	20, 000	.000583	.000117	0.	....	
5, 250	21, 000	.000566	.000033	....	....	
5, 500	22, 000	.000583	.000017	....	....	
5, 750	23, 000	.000633	.000050	....	....	
6, 000	24, 000	.000683	.000050	....	....	
6, 250	25, 000	.000733	.000050	.000050	.000050	
6, 500	26, 000	.000783	.000050	....	....	
6, 750	27, 000	.000833	.000050	....	....	
7, 000	28, 000	.000883	.000050	....	....	
7, 250	29, 000	.000933	.000050	....	....	
7, 500	30, 000	.001000	.000067	.000150	.000100	
7, 750	31, 000	.001050	.000050	....	....	
8, 000	32, 000	.001133	.000083	....	....	
8, 250	33, 000	.001166	.000033	....	....	
8, 500	34, 000	.001216	.000050	....	....	
8, 750	35, 000	.001316	.000100	.000316	.000166	
9, 000	36, 000	.001366	.000050	....	....	
9, 250	37, 000	.001400	.000034	....	....	
9, 500	38, 000	.001483	.000083	....	....	
9, 750	39, 000	.001516	.000033	....	....	
10, 000	40, 000	.001650	.000134	.000483	.000167	Probable elastic limit.
10, 250	41, 000	.001750	.000100	....	....	
10, 500	42, 000	.001883	.000133	....	....	
10, 750	43, 000	.002000	.000117	....	....	
11, 000	44, 000	.002150	.000150	....	....	
11, 250	45, 000	.002233	.000083	.000850	.000367	
11, 500	46, 000	.002516	.000283	....	....	
11, 750	47, 000	.002683	.000167	....	....	
12, 000	48, 000	.003133	.000450	....	....	
12, 250	49, 000	.003500	.000367	....	....	
12, 500	50, 000	.004566	.001066	.002866	.002016	
12, 750	51, 000	.004850	.000284	....	....	
13, 000	52, 000	.005233	.000383	....	....	
13, 250	53, 000	.006050	.000817	....	....	
13, 500	54, 000	.006566	.000516	....	....	
13, 750	55, 000	.007066	.000500	.005166	.002300	
14, 000	56, 000	.007816	.000750	....	....	
14, 250	57, 000	.008516	.000700	....	....	
14, 500	58, 000	.009466	.000950	....	....	
14, 750	59, 000	.010016	.000550	....	....	
15, 000	60, 000	.011133	.001117	.009066	.003900	
15, 500	62, 000	.013000	.001867	....	....	
16, 000	64, 000	.015500	.002500	....	....	
16, 500	66, 000	.017100	.001600	....	....	
17, 000	68, 000	.019916	.002816	....	....	
17, 500	70, 000	.022366	.002450	....	....	
18, 000	72, 000	.025133	.002767	....	....	
18, 500	74, 000	.027900	.002767	....	....	
19, 000	76, 000	.031400	.003500	....	....	
19, 500	78, 000	.033566	.002166	....	....	
20, 000	80, 000	.039650	.006084	....	....	Micrometer removed.
20, 500	82.000	.0433	.003650	....	....	
21, 000	84, 000	.0500	.0067	....	....	
21, 500	86, 000	.0583	.0083	....	....	
22, 000	88, 000	.0683	.0100	....	....	
22, 500	90, 000	.0867	.0184	....	....	
22, 990	91, 960	.1300	.0433	....	....	Ultimate strength.
19, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 91, 960
Elastic limit per square inch of original section .... do.... 40, 000
Elongation per inch after rupture .... inch.. 0. 1783
Elongation per inch under strain at elastic limit .... do ... .001650
Reduction in diameter at point of rupture .... do.... .174
Reduction in area after rupture, per centum of original section 52. 2
Position of rupture .... 2″.25 from middle of stem
Character of broken surface .... fine, silky; cup-shaped ends
Elongation of inch sections .... ″.08, ″.11, ″.14, ″.25 (.″37 fractured section), ″.12

No. 334.

Tension Test.

[Trunnon hoop, 8" B. L. Rifle.]

Marks on bar, $^{8\text{ in R}}_{1972}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000116	.000116			
2,500	10,000	.000283	.000167			
3,750	15,000	.000416	.000133			
5,000	20,000	.000583	.000167	.000016	.000016	
5,250	21,000	.000600	.000017			
5,500	22,000	.000650	.000050			
5,750	23,000	.000683	.000033			
6,000	24,000	.000766	.000083			
6,250	25,000	.000833	.000067	.000133	.000117	
6,500	26,000	.000933	.000100			
6,750	27,000	.001016	.000083			
7,000	28,000	.001100	.000084			
7,250	29,000	.001250	.000150			
7,500	30,000	.001333	.000083	.000466	.000333	Probable elastic limit.
7,750	31,000	.001450	.000117			
8,000	32,000	.001633	.000183			
8,250	33,000	.001733	.000100			
8,500	34,000	.001966	.000233			
8,750	35,000	.002133	.000167	.001083	.000617	
9,000	36,000	.002466	.000333			
9,250	37,000	.002683	.000217			
9,500	38,000	.003183	.000500			
9,750	39,000	.003633	.000450			
10,000	40,000	.004850	.001217	.003516	.000433	
10,250	41,000	.005300	.000450			
10,500	42,000	.005966	.000666			
10,750	43,000	.006633	.000667			
11,000	44,000	.007633	.001000			
11,250	45,000	.008416	.000783	.006833	.003317	
11,500	46,000	.009550	.001134			
11,750	47,000	.010483	.000933			
12,000	48,000	.011883	.001400			
12,250	49,000	.012583	.000700			
12,500	50,000	.014050	.001467	.012233	.005400	
12,750	51,000	.015066	.001016			
13,000	52,000	.016500	.001434			
13,250	53,000	.017250	.000750			
13,500	54,000	.018916	.001666			
13,750	55,000	.020333	.001417	.018333	.006100	
14,000	56,000	.022233	.001900			
14,250	57,000	.023633	.001400			
14,500	58,000	.205400	.001767			
14,750	59,000	.207200	.001800			
15,000	60,000	.029300	.002100	.027016	.008683	
15,500	62,000	.033700	.004400			
16,000	64,000	.038233	.004533			
16,500	66,000	.044200	.005967			
17,000	68,000	.051466	.007266			
17,500	70,000	.058533	.007067			Micrometer removed.
18,000	72,000	.0733	.014767			
18,500	74,000	.0883	.0150			
19,000	76,000	.1350	.0467			Ultimate strength.
17,000						Load at time of rupture.

General summary.

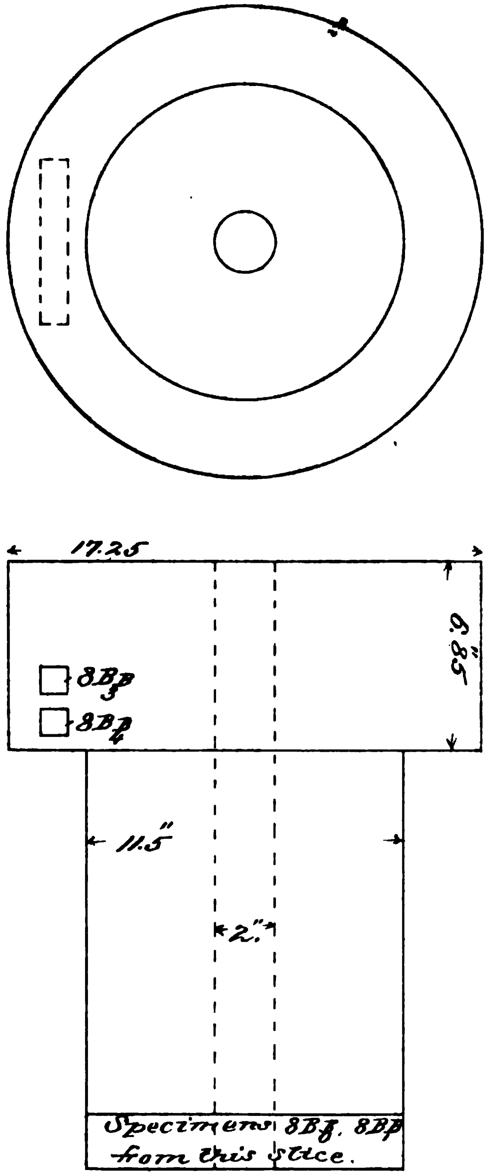
Specific gravity		7.8665
Hardness		16.91
Tensile strength per square inch of original section	pounds..	76,000
Elastic limit per square inch of original section	do....	30,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".60 from middle of stem

Character of broken surface, dull silky center 60 per cent.; fine granular at circumference 40 per cent. Surface of bar has mottled appearance.

Elongation of inch sections .... ".15, ".20 (".43, fractured section), ".12, ".08, ".04

8" Steel B.L. Rifle

Breech Block. Midvale Steel.



No. 406.

Tension Test.

Marks on bar, $\overset{8B_3}{0}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000467	.000100	0.	....	
6,250	25,000	.000667	.000200	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.000933	.000100	0.	....	
10,000	40,000	.001133	.000200	0.	....	
10,250	41,000	.001167	.000034	....	....	
10,500	42,000	.001200	.000033	....	....	
10,750	43,000	.001233	.000033	....	....	
11,000	44,000	.001267	.000034	....	....	
11,250	45,000	.001300	.000033	0.	....	
11,500	46,000	.001333	.000033	....	....	
11,750	47,000	.001367	.000034	....	....	
12,000	48,000	.001433	.000066	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001667	.000200	.000100	.000100	
12,750	51,000	.001733	.000066	....	....	
13,000	52,000	.001800	.000067	....	....	Elastic limit.
13,250	53,000	.002033	.000233	....	....	
13,500	54,000	.002333	.000300	....	....	
13,750	55,000	.002800	.000467	.001100	.001000	
14,000	56,000	.003900	.001100	....	....	
14,250	57,000	.004400	.000500	....	....	
14,500	58,000	.005900	.001500	....	....	
14,750	59,000	.006567	.000667	....	....	
15,000	60,000	.007767	.001200	.005633	.004533	
15,500	62,000	.009633	.001866	....	....	
16,000	64,000	.012067	.002434	....	....	
16,500	66,000	.015233	.003166	....	....	
17,000	68,000	.017000	.001767	....	....	
17,500	70,000	.019367	.002367	....	....	
18,000	72,000	.021333	.001966	....	....	
18,500	74,000	.024733	.003400	....	....	
19,000	76,000	.027033	.002300	....	....	
19,500	78,000	.030833	.003800	....	....	
20,000	80,000	.034600	.003767	....	....	
20,500	82,000	.040900	.006300	....	....	
21,000	84,000	.044667	.003767	....	....	
21,500	86,000	.050833	.006166	....	....	
22,000	88,000	.061000	.010167	....	....	
22,500	90,000	.076667	.015667	....	....	
23,000	92,000	.116667	.040000	....	....	Ultimate strength.

General summary.

Specific gravity		7.8606
Hardness		18.78
Tensile strength per square inch of original section	pounds..	92,000
Elastic limit per square inch of original section	do....	52,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24.6
Position of rupture		1″.10 from neck

Character of broken surface, fine granular; dull spot at circumference, where the fractured surface face is oblique to the axis of the specimen.

Elongation of inch sections .... (″.16 fractured section), ″.17, ″.19

No. 407.

Tension Test.

Marks, $^{8}\frac{B_{3}}{I}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.	....	
2, 500	10, 000	.000167	.000100	0.	....	
3, 750	15, 000	.000367	.000200	0.	....	
5, 000	20, 000	.000467	.000100	0.	....	
6, 250	25, 000	.000667	.000200	0.	....	
7, 500	30, 000	.000867	.000200	0.	....	
8, 750	35, 000	.001033	.000166	0.	....	
10, 000	40, 000	.001200	.000167	0.	....	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001300	.000067	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001367	.000034	....	....	
11, 250	45, 000	.001400	.000033	.000067	.000067	
11, 500	46, 000	.001467	.000067	....	....	Elastic limit.
11, 750	47, 000	.001633	.000166	....	....	
12, 000	48, 000	.001733	.000100	....	....	
12, 250	49, 000	.001867	.000134	....	....	
12, 500	50, 000	.002133	.000266	.000567	.000500	
12, 750	51, 000	.002733	.000600	....	....	
13, 000	52, 000	.003167	.000434	....	....	
13, 250	53, 000	.003800	.000633	....	....	
13, 500	54, 000	.004800	.001000	....	....	
13, 750	55, 000	.005967	.001167	.004067	.003500	
14, 000	56, 000	.007000	.001033	....	....	
14, 250	57, 000	.007933	.000933	....	....	
14, 500	58, 000	.008733	.000800	....	....	
14, 750	59, 000	.009767	.001034	....	....	
15, 000	60, 000	.011333	.001566	.009100	.005033	
15, 500	62, 000	.012800	.001467	....	....	
16, 000	64, 000	.015067	.002267	....	....	
16, 500	66, 000	.017600	.002533	....	....	
17, 000	68, 000	.020367	.002767	....	....	
17, 500	70, 000	.023333	.002966	....	....	
18, 000	72, 000	.026267	.002934	....	....	
18, 500	74, 000	.029500	.003233	....	....	
19, 000	76, 000	.033333	.003833	....	....	
19, 500	78, 000	.037333	.004000	....	....	
20, 000	80, 000	.042333	.005000	....	....	
20, 500	82, 000	.048000	.005667	....	....	
21, 000	84, 000	.056667	.008667	....	....	
21, 500	86, 000	.068333	.011666	....	....	Micrometer removed.
22, 000	88, 000	.0800	.011667	....	....	
22, 300	89, 200	.1400	.0600	....	....	Ultimate strength.
21, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	89, 200
Elastic limit per square inch of original section	do....	46, 000
Elongation per inch after rupture	inch..	0. 1567
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24. 6
Position of rupture		″. 75 from neck

Character of broken surface, granular, 60 per cent.; dull color, 40 per cent. The surface of the dull colored section is oblique to the axis of the specimen.

Elongation of inch sections..(″. 19 fractured section) ″. 16, ″. 12

No. 433.

Tension Test.

[After retreatment in oil.]

Marks on bar, $^{8}\,{}^{BB}_{3}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000267	.000200	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001033	.000133	0.	....	
10,000	40,000	.001200	.000167	0.	....	
10,250	41,000	.001267	.000067	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001300	0.	....	....	
11,000	44,000	.001367	.000067	....	....	
11,250	45,000	.001400	.000033	.000067	.000067	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001567	.000100	....	....	
12,000	48,000	.001667	.000100	....	....	Elastic limit.
12,250	49,000	.001867	.000200	....	....	
12,500	50,000	.002200	.000333	.000600	.000533	
12,750	51,000	.002467	.000267	....	....	
13,000	52,000	.002767	.000300	....	....	
13,250	53,000	.003400	.000633	....	....	
13,500	54,000	.004267	.000867	....	....	
13,750	55,000	.004900	.000633	.003000	.002400	
14,000	56,000	.005900	.001000	....	....	
14,250	57,000	.006600	.000700	....	....	
14,500	58,000	.007500	.000900	....	....	
14,750	59,000	.008667	.001167	....	....	
15,000	60,000	.009633	.000966	....	....	
15,500	62,000	.011000	.001367	....	....	
16,000	64,000	.013000	.002000	....	....	
16,500	66,000	.015333	.002333	....	....	
17,000	68,000	.017833	.002500	....	....	
17,500	70,000	.020000	.002167	....	....	
18,000	72,000	.022667	.002667	....	....	
18,500	74,000	.024700	.002033	....	....	
19,000	76,000	.028267	.003567	....	....	
19,500	78,000	.031400	.003133	....	....	
20,000	80,000	.034833	.003433	....	....	
20,500	82,000	.038600	.003767	....	....	
21,000	84,000	.043733	.005133	....	....	
21,500	86,000	.051000	.007267	....	....	
22,000	88,000	.057000	.006000	....	....	
22,500	90,000	.067667	.010667	....	....	
23,000	92,000	.0833	.015633	....	....	
23,500	94,000	.1200	.0367	....	....	Ultimate strength.
20,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8637
Hardness		18.58
Tensile strength per square inch of original section	pounds..	94,000
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.2067
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		at middle of stem
Character of broken surface		dull spongy; irregular surface
Elongation of inch sections		″.13 (″.36 fractured section), ″.13

No. 434.

Tension Test.

[After retreatment in oil.]

Marks on bar, $^{3}\mathrm{B}_{4}^{\mathrm{B}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	..000267	.000134	0.	....	
3, 750	15, 000	.000400	.000133	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000733	.000166	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001033	.000133	.000033	.000033	
10, 000	40, 000	.001233	.000200	.000067	.000034	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001367	.000034	....	....	
11, 250	45, 000	.001400	.000033	.000100	.000033	
11, 500	46, 000	.001467	.000067	....	....	
11, 750	47, 000	.001567	.000100	....	....	
12, 000	48, 000	.001633	.000066	....	....	
12, 250	49, 000	.001700	.000067	....	....	Elastic limit.
12, 500	50, 000	.001900	.000200	.000333	.000233	
12, 750	51, 000	.002033	.000133	....	....	
13, 000	52, 000	.002267	.000234	....	....	
13, 250	53, 000	.002567	.000300	....	....	
13, 500	54, 000	.003167	.000600	....	....	
13, 750	55, 000	.003933	.000766	.002000	.001667	
14, 000	56, 000	.004667	.000734	....	....	
14, 250	57, 000	.005167	.000500	....	....	
14, 500	58, 000	.006467	.001300	....	....	
14, 750	59, 000	.007167	.000700	....	....	
15, 000	60, 000	.008067	.000900	.005933	.003933	
15, 500	62, 000	.009733	.001666	....	....	
16, 000	64, 000	.011633	.001900	....	....	
16, 500	66, 000	.013733	.002100	....	....	
17, 000	68, 000	.015700	.001967	....	....	
17, 500	70, 000	.017933	.002233	....	....	
18, 000	72, 000	.020833	.002400	....	....	
18, 500	74, 000	.022667	.002334	....	....	
19, 000	76, 000	.026133	.003466	....	....	
19, 500	78, 000	.028600	.002467	....	....	
20, 000	80, 000	.032167	.003567	....	....	
20, 500	82, 000	.034267	.002100	....	....	
21, 000	84, 000	.039333	.005066	....	....	
21, 500	86, 000	.044333	.005000	....	....	
22, 000	88, 000	.049667	.005334	....	....	
22, 500	90, 000	.059333	.009666	....	....	
23, 000	92, 000	.070000	.010667	....	....	
23, 500	94, 000	.0900	0200	....	....	
23, 800	95, 200	.1233	.0333	....	....	Ultimate strength.
20, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	95, 200
Elastic limit per square inch of original section	do....	49, 000
Elongation per inch after rupture	inch..	0. 1983
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44. 6
Position of rupture		″.40 from middle of stem
Character of broken surface		dull spongy; interspersed with fine granulation
Elongation of inch sections		″.11 (″.33 fractured section), ″.14

No. 935.

Tension Test.

Bronze specimen from "Console" for 8″ steel B. L. rifle.
Length, 3″.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033			
750	3,000	.000100	.000067			
1,000	4,000	.000200	.000100			
1,250	5,000	.000267	.000067	0.		
1,500	6,000	.000333	.000066			
1,750	7,000	.000400	.000067			
2,000	8,000	.000467	.000067			
2,250	9,000	.000567	.000100			
2,500	10,000	.000667	.000100	0.		
2,750	11,000	.000767	.000100			
3,000	12,000	.000867	.000100			
3,250	13,000	.000967	.000100			
3,500	14,000	.001100	.000133			
3,750	15,000	.001200	.000100	.000200	.000200	
4,000	16,000	.001367	.000167			
4,250	17,000	.001467	.000100			Elastic limit not well defined.
4,500	18,000	.001700	.000233			
4,750	19,000	.001833	.000133			
5,000	20,000	.002067	.000234	.000533	.000333	
5,250	21,000	.002267	.000200			
5,500	22,000	.002467	.000200			
5,750	23,000	.002800	.000333			
6,000	24,000	.003233	.000433			
6,250	25,000	.003433	.000200	.001367	.000834	
6,500	26,000	.004067	.000634			
6,750	27,000	.004500	.000433			
7,000	28,000	.005633	.001133			
7,250	29,000	.006100	.000467			
7,500	30,000	.007167	.001067	.004567	.003200	
7,750	31,000	.007967	.000800			
8,000	32,000	.009933	.001966			
8,250	33,000	.011433	.001500			
8,500	34,000	.013500	.002067			
8,750	35,000	.014933	.001433			
9,000	36,000	.016933	.002000			
9,250	37,000	.018833	.001900			
9,500	38,000	.021333	.002500			
9,750	39,000	.024667	.003334			
10,000	40,000	.027333	.002666			
10,250	41,000	.030333	.003000			
10,500	42,000	.033000	.002667			
10,750	43,000	.035833	.002833			
11,000	44,000	.039167	.003334			
11,250	45,000	.042500	.003333			
11,500	46,000	.048000	.005500			
11,750	47,000	.050667	.002667			
12,000	48,000	.055000	.004333			
12,250	49,000	.060000	.005000			
12,500	50,000	.064667	.004667			
12,750	51,000	.070000	.005333			
13,000	52,000	.075667	.005667			
13,250	53,000	.0800	.004333			
13,500	54,000	.0867	.0067			
13,750	55,000	.0933	.0066			
14,000	56,000	.1000	.0067			
14,250	57,000	.1067	.0067			
14,500	58,000	.1133	.0066			
14,750	59,000	.1200	.0067			

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
15,000	60,000	.1267	.0067	....	....	
15,250	61,000	.1367	.0100	....	....	
15,500	62,000	.1467	.0100	....	....	
15,750	63,000	.1667	.0200	....	....	Tensile strength.

General summary.

Specific gravity	top..	8.3702
	base..	8.3578
Hardness	top..	8.86
	base..	8.93
Tensile strength per square inch of original section	pounds..	63,000
Elastic limit per square inch of original section	do....	17,000
Elongation per inch after rupture	inch..	0.1900
Elongation per inch under strain at elastic limit	do.....	.001467
Reduction in diameter at point of rupture	do ...	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".25 from middle of stem oblique
Character of broken surface		light yellow color
Elongation of inch sections		".15, ".24*, ".18

TABULATION OF TENSION SPECIMENS FROM 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per. c't.*	*Per cent.*				
375	Steel tube (Whitworth)	Outside A A	37,000	86,880	21.3	30.6	Granular			From breech end.
376		Inside B B	33,000	78,880	19.0	30.4	Fine granular	7.8622	12.31	
428		Inside I	51,000	97,200	24.0	41.9	Silky			
429		Middle M	53,000	100 240	20.0	41 9	......do			From muzzle end.
430		Outside O	58,000	101,920	27.5	36.4	Granular 60 per cent., silky 40 per cent.			
378	Steel jacket (Whitworth)	Outside H H	50,000	88,400	22.3	47.2	Fine silky, trace of granulation			From breech end.
377		Inside J J	30,000	79,320	23.3	33.5	Granular, dull spot	7.8659	12.60	
379		Outside L A	55,000	96,280	25.5	52.2	Fine silky, trace of granulation			
380		Middle L B	31,000	82,840	31.5	49.7	Granular and dull spongy			
381		Inside L C	34,000	84,600	28.0	49.7	Dull spongy			
631	Steel tube (Whitworth)	Outside T T_1	52,000	100,160	18.8	39.2	Fine granular, dull spot	7.8696	20.70	
632		Inside T T_2	51,000	97,400	17.3	41.9	......do			
637	Steel jacket (Whitworth)	Outside T T_1	57,000	103,200	17.7	36.4	Fine granular, dull center	7.8661	20.30	
638		Inside T T_2	48,000	84,360	24.3	41.9	Silky			
639		Outside L_1	61,000	106,800	22.0	47.2	Silky and fine granular			
640		Middle L_2	48,000	85,480	29.5	52.2	Fine silky			
641		Inside L_3	50,000	89,960	27.5	54.6	......do			
335	Steel hoop A_3	Inside 1	48,000	85,920	13.8	54.6	Silky and fine granular	7.8527	14.69	
336		Outside 2	51,000	90,240	13.7	57.0	......do			
345	Steel hoop A_3	Inside 3	60,000	98,920	20.0	52.2	......do			
346		Outside 4	60,000	100,400	17.7	47.2	Fine granular			
402		Middle 5	63,000	105,120	14.3	47.2	Granular 50 per cent., dull smoky 50 per cent			Taken out after retreatment in oil.
403		Middle 6	63,000	108,640	13.2	41.9	Granular 50 per cent., dull smoky 40 per cent			
337	Steel hoop A_{11}	Inside 1	60,000	108,400	15.0	39.2	Fine granular, dull center	7.8598	25.13	This hoop rejected.
347		Outside 2	63,000	108,000	16.7	39.2	......do			
338		Inside 3	59,000	108,600	11.5	27.6	Fine granular, dull spot			
348		Outside 4	56,000	74,000	10.0	00.0	Granular, silvery luster Fractured at defective spot			
404		Middle 5	62,000	104,600	5.8	8.4	Granular, dull spot			
405		Middle 6	58,000	107,660	11.5	30.6	Granular 80 per cent., dull smoky 20 per cent			
410	Steel hoop A_{11}	Middle 7	55,000	103,240	16.7	41.9	Granular, dull smoky, center.	7.8611	23.17	Second hoop to take place of one rejected.
411		Middle 8	55,000	105,440	15.7	39.2	......do			
412		Middle 9	57,000	104,320	13.2	39.2	......do			

TABULATION OF TENSION SPECIMENS FROM 8″ STEEL B. L. RIFLE—Continued.

No. of test.	Position in gun.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per c't.*	*Per cent.*				
339	Steel hoop B_3	Inside 1	67,000	113,600	11.8	39.2	Fine granular and dull smoky	7.8564	26.83	
340		Outside 2	62,000	110,000	11.0	39.2	do			
349		Inside 3	65,000	108,920	16.7	39.2	do			
350		Outside 4	70,000	111,160	15.0	39.2	do			
330	Steel hoop B_4	Inside 1	59,000	102,880	14.0	47.2	do			
331		Outside 2	59,000	104,440	13.2	39.2	Fine granular, dull spot	7.8581	22.90	
328		Inside 3	57,000	102,960	19.3	41.9	Fine granular and dull smoky			
329		Outside 4	54,000	100,000	17.7	44.6	do			
342	Steel hoop C_2	Middle 3	59,000	109,800	12.0	36.4	do			Hammered hoop.
341	Steel hoop C_4	do	66,000	115,160	13.7	39.2	do			Do.
343	Steel hoop D_2	do	60,000	111,600	14.3	39.2	do			Do.
344		Middle 4	64,000	113,440	11.9	36.4	do			
332	Steel trunnion hoop (Whitworth).		39,000	92,120	17.0	52.2	Fine silky			
333			40,000	91,960	17.8	52.2	do			
334			30,000	76,000	17.3	47.2	Dull silky and fine granular	7.8665	16.91	
406	Steel breech block		52,000	92,000	18.8	24.6	Fine granular, dull spot	7.8606	18.78	
407			46,000	89,200	15.7	24.6	Granular, dull spot			
433			48,000	94,000	20.7	44.6	Dull spongy	7.8637	1[illegible]58	Taken out after retreatment in oil.
434			49,000	93,200	19.3	44.6	Dull spongy and granular			
935	Bronze console		17,000	63,000	19.0	21.4	Light yellow color	8.3702* 8.8578†	8.86* 8.93†	

* Top. † Base.

TABULATION OF COMPRESSION SPECIMENS FROM 8" STEEL B. L. RIFLE.

No. of test.	Position in gun.	Location of specimen.	Length.	Diameter.	Sectional area.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*		
392	Steel tube (Whitworth).	Inside CC.....	5.00	.798	.50	36,000	....	....	From breech end.
393	....	Outside DD...	5.00	.798	.50	32,000	....		
394	....	Middle EE....	5.00	.798	.50	33,000	....		
399	....	Radial FF....	3.005	.7965	.498	....	....	Sides swelled and deflected laterally.	Loaded with 150,000 pounds per square inch.
400	....	Radial GG....	3.003	.7965	.498	....	....	......do	Do.
395	Steel jacket (Whitworth)	Inside II......	5.00	.798	.50	27,000	....		
396	....	Outside KK ..	5.00	.798	.50	40,000	....		
397	....	Radial MM ...	5.00	.798	.50	30,000	....		
398	....	Radial NN....	5.00	.798	.50	29,000	....		
631	Steel tube (Whitworth).	Outside TC_1 ..	5.00	.797	.50	53,000	90,760	Triple flexure............	
500	....	Middle TC_2...	5.00	.797	.50	53,000	96,820	......do	Loaded with 150,000 pounds per square inch.
501	....	Inside TC_3....	5.00	.797	.50	52,000	91,560	......do	Do.
502	....	Radial RC_1 ...	3.00	.797	.50	....	....	Deflected at middle; shortened to 2".12.	
503	....	Radial RC_2 ...	3.00	.797	.50	....	....	Deflected at middle; shortened to 1".81.	
505	Steel jacket (Whitworth)	Outside TC_1 ..	5.00	.797	.50	56,000	87,280	Triple flexure............	
506	....	Inside TC_3....	5.00	.797	.50	45,000	79,000	......do	
507	....	Radial RC_1 ...	5.00	.797	.50	49,000	88,640	......do	
508	....	Radial RC_2 ...	5.00	.797	.50	45,000	81,520	......do	
408	Steel hoop A_4............	....	8.972	1.129	1.00	65,000	82,800	......do	
409	....	....	8.95	1.129	1.00	63,000	78,400	......do	
410	Steel hoop B_2	....	8.99	1.129	1.00	61,000	84,100	......do	
411	....	....	8.97	1.129	1.00	Not well defined.	86,400	......do	
382	Steel hoop C_2	Middle 4......	8.96	1.132	1.007	60,000	....	....	
381	Steel hoop C_4	....do	8.965	1.132	1.007	60,000	....	....	

10″ STEEL WIRE-WOUND RIFLE.

[Steel specimens from tube, sleeve, hoops and trunnion ring.]

No. 717.

Marks, $^{10}\frac{A}{B}{}^{R}$
Diameter, ″.505.
Sectional area, .20 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1, 000	0.	0.	0.	0.	Initial load.
1, 000	5, 000	.000050	.000050	0.	....	
2, 000	10, 000	.000150	.000100	0.	....	
3, 000	15, 000	.000400	.000250	0.	....	
4, 000	20, 000	.000700	.000300	0.	....	
5, 000	25, 000	.000800	.000100	0.	....	
6, 000	30, 000	.001000	.000200	0.	....	
6, 200	31, 000	.001100	.000100	....	....	
6, 400	32, 000	.001150	.000050	....	....	
6, 600	33, 000	.001200	.000050	....	....	
6, 800	34, 000	.001250	.000050	....	....	
7, 000	35, 000	.001250	.0	0.	....	
7, 200	36, 000	.001300	.000050	....	....	
7, 400	37, 000	.001350	.000050	....	....	
7, 600	38, 000	.001400	.000050	....	....	
7, 800	39, 000	.001500	.000100	....	....	
8, 000	40, 000	.001550	.000050	000050	.000050	Elastic limit.
8, 200	41, 000	.003750	.002200	....	....	
8, 400	42, 000	.006200	.002550	....	....	
8, 600	43, 000	.007000	.000700	....	....	
8, 800	44, 000	.008000	.001000	....	....	
9, 000	45, 000	.008500	.000500	.006250	.006200	
9, 200	46, 000	.009000	.000500	....	....	
9, 400	47, 000	.009750	.000750	....	....	
9, 600	48, 000	.010500	.000750	....	....	
9, 800	49, 000	.011500	.001000	....	....	
10, 000	50, 000	.012500	.001000	.010100	.003850	
10, 400	52, 000	.014200	.001700	....	....	
10, 800	54, 000	.016750	.002550	....	....	
11, 200	56, 000	.018500	.001750	....	....	
11, 600	58, 000	.020250	.001750	....	....	
12, 000	60, 000	.022750	.002500	....	....	
12, 400	62, 000	.024750	.002000	....	....	
12, 800	64, 000	.027000	.002250	....	....	
13, 200	66, 000	.030750	.003750	....	....	
13, 600	68, 000	.033250	.002500	....	....	
14, 000	70, 000	.037400	.004150	....	....	
14, 400	72, 000	.041000	.003600	....	....	
14, 800	74, 000	.045300	.004300	....	....	
15, 200	76, 600	.051000	.005700	....	....	
15, 600	78, 000	.056500	.005500	....	....	
16, 000	80, 000	.063500	.007000	....	....	
16, 400	82, 000	.0800	.0165	....	....	
16, 800	84, 000	.0900	.0100	....	....	
17, 200	86, 000	.1150	.0250	....	....	
17, 500	87, 500	.1600	.0450	....	....	Tensile strength.
15, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8708
Tensile strength per square inch of original section	pounds..	87, 500
Elastic limit per square inch of original section	do....	40, 000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.115
Reduction in area after rupture, per centum of original section		40.5
Position of rupture		″.2 from middle of stem

Character of broken surface, granular, radiating from center 60 per cent.; dull smoky color, 40 per cent.

Elongation of inch sections .... ″.18, ″.29

No. 718.

Marks, $\overset{10\text{ A B}}{\text{M}}$
Diameter, ″.505.
Sectional area, .20 square inch.

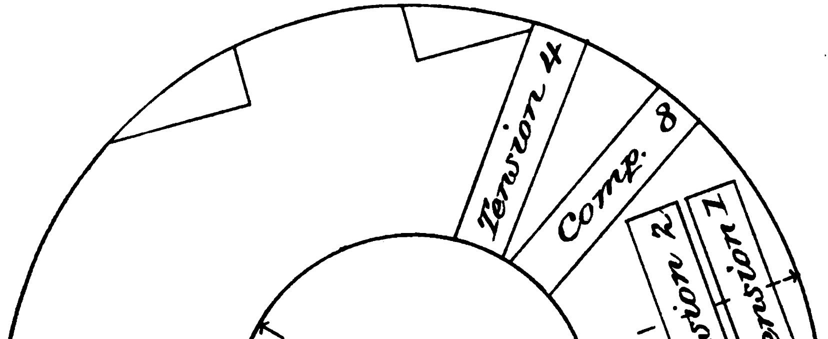
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
200	1,000	0.	0.	0.	0.	Initial load.
1,000	5,000	.000200	.000200	.000050	.000050	
2,000	10,000	.000400	.000200	.000050	0.	
3,000	15,000	.000600	.000200	.000050	0.	
4,000	20,000	.000800	.000200	.000050	0.	
5,000	25,000	.001000	.000200	.000050	0.	
6,000	30,000	.001250	.000250	.000050	0.	
6,200	31,000	.001300	.000050	....	....	
6,400	32,000	.001350	.000050	....	....	
6,600	33,000	.001400	.000050	....	....	
6,800	34,000	.001450	.000050	....	....	
7,000	35,000	.001500	.000050	.000250	.000200	
7,200	36,000	.001600	.000100	....	....	
7,400	37,000	.001700	.000100	....	....	
7,600	38,000	.001750	.000050	....	....	
7,800	39,000	.001750	0.	....	....	
8,000	40,000	.001800	.000050	.000450	.000200	Elastic limit.
8,200	41,000	.005350	.003550	....	....	
8,400	42,000	.005950	.000600	....	....	
8,600	43,000	.006550	.000600	....	....	
8,800	44,000	.007000	.000450	....	....	
9,000	45,000	.007750	.000750	.005750	.005300	
9,200	46,000	.009000	.001250	....	....	
9,400	47,000	.009100	.000100	....	....	
9,600	48,000	.009750	.000650	....	....	
9,800	49,000	.010650	.000900	....	....	
10,000	50,000	.011000	.000350	.008500	.002750	
10,400	52,000	.012300	.001300	....	....	
10,800	54,000	.014800	.002500	....	....	
11,200	56,000	.017000	.002200	....	....	
11,600	58,000	.019000	.002000	....	....	
12,000	60,000	.020300	.001300	....	....	
12,400	62,000	.022750	.002450	....	....	
12,800	64,000	.025400	.002650	....	....	
13,200	66,000	.029300	.003900	....	....	
13,600	68,000	.032500	.003200	....	....	
14,000	70,000	.035500	.003000	....	....	
14,400	72,000	.039000	.003500	....	....	
14,800	74,000	.043850	.004850	....	....	
15,200	76,000	.048000	.004150	....	....	
15,600	78,000	.054500	.006500	....	....	
16,000	80,000	.063400	.008900	....	....	
16,400	82,000	.0700	.0066	....	....	
16,800	84,000	.0800	.0100	....	....	
17,200	86,000	.1000	.0200	....	....	
17,480	87,400	.1350	.0350	....	....	Tensile strength.

General summary.

Specific gravity		7.8700
Tensile strength per square inch of original section	pounds..	87,400
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.1800
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.095
Reduction in area after rupture, per centum of original section		34.0
Position of rupture		″.25 from middle of stem
Character of broken surface		granular, 60 per cent.; dull, smoky color, 40 per cent.
Elongation of inch sections.		″.26, ″.10

10" Steel wire-wound Rifle

Tube



No. 830.

Specimens from Breech End.

Marks, $\overset{1\,B}{\underset{T}{10\,W}}$

Diameter, ''.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000200	.000200	.000050	.000050	
2,500	10,000	.000400	000200	.000050	0.	
3,750	15,000	.000600	.000200	.000100	.000050	
5,000	20,000	.000700	.000100	.000100	0.	
6,250	25,000	.000950	.000250	.000150	.000050	
7,500	30,000	.001150	.000200	.000150	0.	
7,750	31,000	.001150	0.	....	....	
8,000	32,000	.001200	.000050	....	....	
8,250	33,000	.001250	.000050	....	....	
8,500	34,000	.001300	.000050	....	....	
8,750	35,000	.001350	.000050	.000150	0.	
9,000	36,000	.001400	.000050	....	....	Elastic limit.
9,250	37,000	.001900	.000500	....	....	
9,500	38,000	.004950	.003050	....	....	
9,750	39,000	.006550	.001600	....	....	
10,000	40,000	.009150	.002600	.007650	.007500	
10,250	41,000	.010400	.001250	....	....	
10,500	42,000	.010850	.000450	....	....	
10,750	43,000	.011250	.000400	....	....	
11,000	44,000	.011950	.000700	....	....	
11,250	45,000	.013050	.001100	.011400	.003750	
11,500	46,000	.013850	.000800	....	....	
11,750	47,000	.014700	.000850	....	....	
12,000	48,000	.015950	.001250	....	....	
12 250	49,000	.017200	.001250	....	....	
12,500	50,000	.018450	.001250	.016450	.005050	
12,750	51,000	.019050	.000600	....	....	
13,000	52,000	.020100	.001050	....	....	
13,250	53,000	.021750	.001650	....	....	
13,500	54,000	.023500	.001750	....	....	
13,750	55,000	.024750	.001250	....	....	
14,000	56,000	.026500	.001750	....	....	
14,250	57,000	.028000	.001500	....	....	
14,500	58,000	.029500	.001500	....	....	
14,750	59,000	.031150	.001650	....	....	
15,000	60,000	.033550	.002400	....	....	
15,500	62,000	.037500	.003950	....	....	
16,000	64,000	.042000	.004500	....	....	
16,500	66,000	.048000	.006000	....	....	
17,000	68,000	.054750	.006750	....	....	
17,500	70,000	.062000	.007250	....	....	
18,000	72,000	.0700	.0080	....	....	
18,500	74,000	.0900	.0200	....	....	
19,000	76,000	.1100	.0200	....	....	
19,320	77,280	.1650	.0550	....	....	Tensile strength.
16,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	77,280
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.2900
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		middle of stem
Character of broken surface		silky
Elongation of inch sections		''.28*, ''.30

No. 830½.

Marks, $\underset{\mathrm{T}}{\overset{2\,\mathrm{B}}{10\,\mathrm{W}}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000350	.000200	0.		
3,750	15,000	.000450	.000100	0.		
5,000	20,000	.000600	.000150	0.		
6,250	25,000	.000800	.000200	0.		
7,500	30,000	.001000	.000200	0.		
7,750	31,000	.001000	0.			
8,000	32,000	.001050	.000050			
8,250	33,000	.001100	.000050			
8,500	34,000	.001150	.000050			
8,750	35,000	.001250	.000100	.000100	.000100	Elastic limit.
9,000	36,000	.002000	.000750			
9,250	37,000	.003100	.001100			
9,500	38,000	.005900	.002800			
9,750	39,000	.007100	.001200			
10,000	40,000	.007850	.000750	.006350	.006250	
10,250	41,000	.008850	.001000			
10,500	42,000	.009250	.000400			
10,750	43,000	.009750	.000500			
11,000	44,000	.010600	.000850			
11,250	45,000	.011500	.000900	.009850	.003500	
11,500	46,000	.012500	.001000			
11,750	47,000	.013500	.001000			
12,000	48,000	.014650	.001150			
12,250	49,000	.015650	.001000			
12,500	50,000	.016650	.001000	.014750	.004900	
12,750	51,000	.017500	.000850			
13,000	52,000	.018500	.001000			
13,250	53,000	.019650	.001150			
13,500	54,000	.021200	.001550			
13,750	55,000	.022600	.001400			
14,000	56,000	.024300	.001700			
14,250	57,000	.026000	.001700			
14,500	58,000	.027500	.001500			
14,750	59,000	.028500	.001000			
15,000	60,000	.030100	.001600			
15,500	62,000	.033500	.003400			
16,000	64,000	.038000	.004500			
16,500	66,000	.043000	.005000			
17,000	68,000	.047750	.004750			
17,500	70,000	.0550	.007250			
18,000	72,000	.0600	.0050			
18,500	74,000	.0800	.0200			
19,000	76,000	.0950	.0150			
19,500	78,000	.1100	.0150			
19,960	79,840	.1750	.0650			Tensile strength.
18,200						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	79,840
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.2950
Elongation per inch under strain at elastic limit	do	.001250
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		middle of stem
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.26, ″.33

No. 831.

Marks, $10\overset{8\,B}{\underset{T}{W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000050	.000050	—.000050	—.000050	
2,500	10,000	.000150	.000100	—.000050	0.	
3,750	15,000	.000250	.000100	—.000050	0.	
5,000	20,000	.000450	.000200	—.000050	0.	
6,250	25,000	.000550	.000100	—.000050	0.	
7,500	30,000	.000750	.000200	—.000050	0.	
7,750	31,000	.000750	0.	....	....	
8,000	32,000	.000800	.000050	....	....	
8,250	33,000	.000850	.000050	....	....	
8,500	34,000	.000900	.000050	....	....	
8,750	35,000	.000950	.000050	.000050	.000100	Elastic limit.
9,000	36,000	.002600	.001650	....	....	
9,250	37,000	.004050	.001450	....	....	
9,500	38,000	.005500	.001450	....	....	
9,750	39,000	.006550	.001050	....	....	
10,000	40,000	.007150	.000600	.005750	.005700	Rested under initial load 1 hour.
10,250	41,000	.007900	.000750	....	....	
10,500	42,000	.008900	.001000	....	....	
10,750	43,000	.009600	.000700	....	....	
11,000	44,000	.010300	.000700	....	....	
11,250	45,000	.011200	.000900	.009600	.003850	
11,500	46,000	.012200	.001000	....	....	
11,750	47,000	.012900	.000700	....	....	
12,000	48,000	.014150	.001250	....	....	
12,250	49,000	.015000	.000850	....	....	
12,500	50,000	.016050	.001050	.014200	.004600	
12,750	51,000	.017000	.000950	....	....	
13,000	52,000	.018100	.001100	....	....	
13,250	53,000	.019200	.001100	....	....	
13,500	54,000	.020500	.001300	....	....	
13,750	55,000	.021650	.001150	....	....	
14,000	56,000	.023250	.001600	....	....	
14,250	57,000	.024450	.001200	....	....	
14,500	58,000	.025950	.001500	....	....	
14,750	59,000	.027400	.001450	....	....	
15,000	60,000	.029450	.002050	....	....	
15,500	62,000	.032750	.003300	....	....	
16,000	64,000	.036400	.003650	....	....	
16,500	66,000	.041000	.004600	....	....	
17,000	68,000	.047250	.006250	....	....	
17,500	70,000	.053000	.005750	....	....	
18,000	72,000	.0600	.0070	....	....	
18,500	74,000	.0700	.0100	....	....	
19,000	76,000	.0850	.0150	....	....	
19,500	78,000	.1050	.0200	....	....	
19,910	79,640	.1750	.0700	....	....	Tensile strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8630
Hardness	13.08
Tensile strength per square inch of original section ... pounds..	79,640
Elastic limit per square inch of original section ... do....	35,000
Elongation per inch after rupture ... inch..	0.2750
Elongation per inch under strain at elastic limit ... do ...	.000950
Reduction in diameter at point of rupture ... do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	″.50 from middle of stem
Character of broken surface	silky 50 per cent., fine granular 50 per cent
Elongation of inch sections	″.38*, ″.17

No. 832.

Marks, $10\overset{4\,B}{\underset{T}{W}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000350	.000200	0.	....	
3,750	15,000	.000550	.000200	.000050	.000050	
5,000	20,000	.000650	.000100	.000050	0.	
6,250	25,000	.000850	.000200	.000050	0.	
7,500	30,000	.001000	.000150	.000050	0.	
7,750	31,000	.001050	.000050	....	....	
8,000	32,000	.001100	.000050	....	....	
8,250	33,000	.001150	.000050	....	....	
8,500	34,000	.001200	.000050	....	....	
8,750	35,000	.001250	.000050	.000100	.000050	
9,000	36,000	.001300	.000050	....	....	Elastic limit.
9,250	37,000	.002100	.000800	....	....	
9,500	38,000	.002650	.000550	....	....	
9,750	39,000	.003750	.001100	....	....	
10,000	40,000	.007400	.003650	.005900	.005800	
10,250	41,000	.008200	.000800	....	....	
10,500	42,000	.009100	.000900	....	....	
10,750	43,000	.010000	.000900	....	....	
11,000	44,000	.010750	.000750	....	....	
11,250	45,000	.011500	.000750	.009750	.003850	
11,500	46,000	.012550	.001050	....	....	
11,750	47,000	.013250	.000700	....	....	
12,000	48,000	.014350	.001100	....	....	
12,250	49,000	.015550	.001200	....	....	
12,500	50,000	.016550	.001000	.014650	.004900	
12,750	51,000	.017400	.000850	....	....	
13,000	52,000	.018500	.001100	....	....	
13,250	53,000	.019550	.001050	....	....	
13,500	54,000	.021050	.001500	....	....	
13,750	55,000	.022500	.001450	....	....	
14,000	56,000	.024050	.001550	....	....	
14,250	57,000	.025400	.001350	....	....	
14,500	58,000	.026900	.001500	....	....	
14,750	59,000	.028500	.001600	....	....	
15,000	60,000	.030150	.001650	....	....	
15,500	62,000	.033550	.003400	....	....	
16,000	64,000	.037700	.004150	....	....	
16,500	66,000	.042800	.005100	....	....	
17,000	68,000	.047850	.005050	....	....	
17,500	70,000	.055000	.007150	....	....	
18,000	72,000	.064000	.009000	....	....	
18,500	74,000	.074000	.010000	....	....	
19,000	76,000	.0900	.0160	....	....	
19,500	78,000	.1100	.0200	....	....	
19,820	79,280	.1900	.0800	....	....	Tensile strength.
17,800	....	....	....	....	....	

General summary.

Tensile strength per square inch of original section	pounds..	79,280
Elastic limit per square inch of original section	do ...	36,000
Elongation per inch after rupture	inch..	0.2700
Elongation per inch under strain at elastic limit	do ...	.001300
Reduction in diameter at point of rupture	do ...	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.6 from middle of stem
Character of broken surface		fine granular 60 per cent., silky 40 per cent.
Elongation of inch sections		″.37*, ″.17

No. 523

Marks, $\overset{7\,B}{\underset{T}{10\,W}}$

Length, 4''.5.

Diameter, ''.798.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000333	.000166	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	0.	....	
12,500	25,000	.000833	.000166	0.	....	
15,000	30,000	.001000	.000167	0.	....	
15,500	31,000	.001033	.000033	....	....	
16,000	32,000	.001100	.000067	....	....	
16,500	33,000	.001133	.000033	....	....	
17,000	34,000	.001200	.000067	....	....	Elastic limit.
17,500	35,000	.001333	.000133	.000167	.000167	
18,000	36,000	.001867	.000534	....	....	
18,500	37,000	.002433	.000566	....	....	
19,000	38,000	.003567	.001134	....	....	
19,500	39,000	.004133	.000566	....	....	
20,000	40,000	.005333	.001200	.003900	.003733	
38,620	77,240	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	34,000
Compression per inch under stress at elastic limit	inch..	0.001200
Ultimate strength per square inch of original section	pounds..	77,240
Manner of failure		triple flexure

No. 524.

Marks, $\overset{8\,B}{\underset{T}{10\,W}}$
Length, 4''.5.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000133	.000133	0.	....	
5,000	10,000	.000267	.000134	0.	....	
7,500	15,000	.000467	.000200	0.	....	
10,000	20,000	.000633	.000166	0.	....	
12,500	25,000	.000767	.000134	0.	....	
15,000	30,000	.000933	.000166	0.	....	
15,500	31,000	.000967	.000034	....	....	
16,000	32,000	.001000	.000033	....	....	
16,500	33,000	.001033	.000033	....	....	
17,000	34,000	.001033	0.	....	....	
17,500	35,000	.001100	.000067	0.	....	Elastic limit.
18,000	36,000	.001233	.000133	....	....	
18,500	37,000	.001400	.000167	....	....	
19,000	38,000	.004500	.003100	....	....	
19,500	39,000	.007667	.003167	....	....	
20,000	40,000	008300	,000633	.006833	.006833	
38,720	77,440	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	35,000
Compression per inch under stress at elastic limit	inch..	0.001100
Ultimate strength per square inch of original section	pounds..	77,440
Manner of failure		triple flexure

No. 519.

Compression Test.

Marks, $\overset{5\ B}{\underset{T}{10\ W}}$

Length, 10''.15.

Diameter, 1''.005.

Sectional area, .793 square inch.

Shortened 1 per cent. of length and afterwards tested by tension.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
793	1,000	0.	0.	0.	0.	Initial load.
3,965	5,000	.000155	.000155	.000000	.000000	
7,930	10,000	.000289	.000134	.000022	.000022	
11,895	15,000	.000444	.000155	.000022	0.	
15,860	20,000	.000622	.000178	.000022	0.	
19,825	25,000	.000775	.000153	.000022	0.	
20,618	26,000	.000822	.000047	....	....	
21,411	27,000	.000867	.000045	....	....	
22,204	28,000	.000889	.000022	....	....	
22,997	29,000	.000911	.000022	....	....	
23,790	30,000	.000933	.000022	.000044	.000022	
24,583	31,000	.000978	.000045	....	....	
25,376	32,000	.001022	.000044	....	....	
26,169	33,000	.001066	.000044	....	....	
26,962	34,000	.001089	.000023	....	....	
27,755	35,000	.001133	.000044	.000067	.000023	
28,548	36,000	.001155	.000022	....	....	
29,341	37,000	.001200	.000045	....	....	Elastic limit.
30,134	38,000	.001955	.000755	....	....	
30,927	39,000	.008355	.006400	....	....	
31,720	40,000	.009555	.001200	....	....	
32,513	41,000	.010066	.000511	....	....	
33,306	42,000	011111	.001045	.009733	.009666	Test discontinued.

General summary.

Elastic limit per square inch of original section..........pounds..	**37,000**
Compression per inch under stress at elastic limit..........inch..	**0.001200**
Manner of failure..........	**deflected at middle ''.09**

No. 837.

Tension Test.

Previously shortened 1 per cent. by compression.

Marks, $\overset{5\,B}{\underset{T}{{}_{10}W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000450	.000150	....	....	
5,000	20,000	.000617	.000167	....	....	
5,250	21,000	.000650	.000033	....	....	
5,500	22,000	.000683	.000033	....	....	
5,750	23,000	.000733	.000050	....	....	Elastic limit.
6,000	24,000	.000867	.000134	....	....	
6,250	25,000	.001017	.000150	.000317	.000317	
6,500	26,000	.001417	.000400	....	....	
6,750	27,000	.001633	.000216	....	....	
7,000	28,000	.002100	.000467	....	....	
7,250	29,000	.002350	.000250	....	....	
7,500	30,000	.002933	.000583	.002033	.001716	
7,750	31,000	.003367	.000434	....	....	
8,000	32,000	.003900	.000533	....	....	
8,250	33,000	.004217	.000317	....	....	
8,500	34,000	.004967	.000750	....	....	
8,750	35,000	.005417	.000450	.004300	.002267	
9,000	36,000	.006117	.000700	....	....	
9,250	37,000	.006450	.000333	....	....	
9,500	38,000	.007500	.001050	....	....	
9,750	39,000	.007917	.000417	....	....	
10,000	40,000	.009233	.001316	.007817	.003517	
10,250	41,000	.009650	.000417	....	....	
10,500	42,000	.010300	.000650	....	....	
10,750	43,000	.011033	.000733	....	....	
11,000	44,000	.012367	.001334	....	....	
11,250	45,000	.013333	.000966	....	....	
11,500	46,000	.014350	.001017	....	....	
11,750	47,000	.015300	.000950	....	....	
12,000	48,000	.016767	.001467	....	....	
12,250	49,000	.018000	.001233	....	....	
12,500	50,000	.019500	.001500	....	....	
12,750	51,000	.020667	.001167	....	....	
13,000	52,000	.022000	.001333	....	....	
13,250	53,000	.023333	.001333	....	....	
13,500	54,000	.025167	.001834	....	....	
13,750	55,000	.026583	.001416	....	....	
14,000	56,000	.028467	.001884	....	....	
14,250	57,000	.030000	.001533	....	....	
14,500	58,000	.031917	.001917	....	....	
14,750	59,000	.0333	.001383	....	....	
15,000	60,000	.0350	.0017	....	....	
15,500	62,000	.0417	.0067	....	....	
16,000	64,000	.0483	.0066	....	....	
16,500	66,000	.0533	.0050	....	....	
17,000	68,000	.0617	.0084	....	....	
17,500	70,000	.0717	.0100	....	....	
18,000	72,000	.0850	.0133	....	....	
18,500	74,000	.1133	.0283	....	....	
19,000	76,000	.1600	.0467	....	....	
19,020	76,080	.1733	.0133	....	....	Tensile strength.
17,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	76,080
Elastic limit per square inch of original section	do....	23,000
Elongation per inch after rupture	inch..	0.2167
Elongation per inch under strain at elastic limit	do....	.000733
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″6 from middle of stem
Character of broken surface		dull silky 50 per cent., fine granular 50 per cent.
Elongation of inch sections		″.12, ″.19, ″.47*, ″.21, ″.16, ″.15

No. 520.

Compression Test.

Marks, $\overset{6\,B}{\underset{T}{10\,W}}$

Length, 10″.15.

Diameter, 1″.017.

Sectional area, .812 square inch.

Shortened 1 per cent. of length and afterwards tested by tension.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
812	1,000	0.	0.	0.	0.	Initial load.
4,060	5,000	.000140	.000140	0.	....	
8,120	10,000	.000280	.000140	0.	....	
12,180	15,000	.000440	.000160	0.	....	
16,240	20,000	.000580	.000140	0.	....	
20,300	25,000	.000780	.000200	.000020	.000020	
21,112	26,000	.000800	.000020	....	....	
21,924	27,000	.000840	.000040	....	....	
22,736	28,000	.000860	.000020	....	....	
23,548	29,000	.000880	.000020	....	....	
24,360	30,000	.000920	.000040	.000020	0.	
25,172	31,000	.000980	.000060	....	....	
25,984	32,000	.001000	.000020	....	....	
26,796	33,000	.001000	0.	....	....	Elastic limit.
27,608	34,000	.002380	.001380	....	....	
28,420	35,000	.004080	.001700	....	....	
29,232	36,000	.004800	.000720	....	....	
30,044	37,000	.005180	.000380	....	....	
30,856	38,000	.005520	.000340	....	....	
31,668	39,000	.005680	.000160	....	....	
32,480	40,000	.005720	.000040	....	....	
33,292	41,000	.005760	.000040	....	....	
34,104	42,000	.005780	.000020	....	....	
34,916	43,000	.005800	.000020	.004520	.004500	
35,728	44,000	.01	....	....	....	Test discontinued.

General summary.

Elastic limit per square inch of original section ....pounds.. 33,000
Compression per inch under stress at elastic limit ....inch..0.001000
Manner of failure..deflected at the middle ″.095

No. 838.

Tension Test.

Previously shortened 1 per cent. by compression.

Marks, $\overset{6\,B}{\underset{T}{10\,W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000017	.000017	
2,500	10,000	.000317	.000150	.000017	0.	
3,750	15,000	.000467	.000150	.000033	.000016	
5,000	20,000	.000633	.000166	.000067	.000034	
5,250	21,000	.000650	.000017	....	....	Elastic limit.
5,500	22,000	.000700	.000050	....	....	
5,750	23,000	.000767	.000067	....	....	
6,000	24,000	.000850	.000083	....	....	
6,250	25,000	.000950	.000100	.000233	.000166	
6,500	26,000	.001217	.000267	....	....	
6,750	27,000	.001333	.000116	....	....	
7,000	28,000	.001867	.000534	....	....	
7,250	29,000	.002117	.000250	....	....	
7,500	30,000	.002633	.000516	.001700	.001467	
7,750	31,000	.002950	.000317	....	....	
8,000	32,000	.003450	.000500	....	....	
8,250	33,000	.003833	.000383	....	....	
8,500	34,000	.004650	.000817	....	....	
8,750	35,000	.005050	.000400	.003900	.002200	
9,000	36,000	.005650	.000600	....	....	
9,250	37,000	.005967	.000317	....	....	
9,500	38,000	.007050	.001083	....	....	
9,750	39,000	.007500	.000450	....	....	
10,000	40,000	.008100	.000600	.006683	.002783	
10,250	41,000	.008683	.000583	....	....	
10,500	42,000	.009500	.000817	....	....	
10,750	43,000	.010133	.000633	....	....	
11,000	44,000	.011183	.001050	....	....	
11,250	45,000	.012333	.001150	....	....	
11,500	46,000	.013333	.001000	....	....	
11,750	47,000	.014500	.001167	....	....	
12,000	48,000	.015667	.001167	....	....	
12,250	49,000	.016250	.000583	....	....	
12,500	50,000	.017000	.000750	....	....	
13,000	52,000	.020000	.003000	....	....	
13,500	54,000	.022583	.002583	....	....	
14,000	56,000	.025250	.002667	....	....	
14,500	58,000	.028167	.002917	....	....	
15,000	60,000	.032000	.003833	....	....	
15,500	62,000	.0350	.0030	....	....	
16,000	64,000	.0400	.0050	....	....	
16,500	66,000	.0467	.0067	....	....	
17,000	68,000	.0533	.0066	....	....	
17,500	70,000	.0617	.0084	....	....	
18,000	72,000	.0700	.0083	....	....	
18,500	74,000	.0850	.0150	....	....	
19,000	76,000	.1050	.0200	....	....	
19,400	77,600	.1417	.0367	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	77,600
Elastic limit per square inch of original section	do...	21,000
Elongation per inch after rupture	inch..	0.1667
Elongation per inch under strain at elastic limit	do....	.000650
Reduction in diameter at point of rupture	do ...	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		″.62 from neck
Character of broken surface		silky
Elongation of inch sections		″.37*, ″.15, ″.12, ″.13, ″.11, ″.12

No. 833.

Specimens from Muzzle End.

Marks, $10\overset{1\,M}{\underset{T}{W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000250	.000250	.000050	.000050	
2,500	10,000	.000400	.000150	.000050	0.	
3,750	15,000	.000600	.000200	.000100	.000050	
5,000	20,000	.000750	.000150	.000100	0.	
6,250	25,000	.000950	.000200	.000100	0.	
7,500	30,000	.001150	.000200	.000150	.000050	
7,750	31,000	.001200	.000050	....	....	
8,000	32,000	.001250	.000050	....	....	
8,250	33,000	.001300	.000050	....	....	
8,500	34,000	.001350	.000050	....	....	Elastic limit.
8,750	35,000	.002100	.001050	.001300	.001150	
9,000	36,000	.005850	.003450	....	....	
9,250	37,000	.009000	.003150	....	....	
9,500	38,000	.011000	.002000	....	....	
9,750	39,000	.011750	.000750	....	....	
10,000	40,000	.012300	.000550	.010950	.009650	
10,250	41,000	.013650	.001350	....	....	
10,500	42,000	.014550	.000900	....	....	
10,750	43,000	.015000	.001050	....	....	
11,000	44,000	.016750	.001150	....	....	
11,250	45,000	.017850	.001100	.016050	.005100	
11,500	46,000	.019100	.001250	....	....	
11,750	47,000	.020600	.001500	....	....	
12,000	48,000	.022400	.001800	....	....	
12,250	49,000	.023500	.001100	....	....	
12,500	50,000	.025500	.002000	.023450	.007400	
12,750	51,000	.026300	.000800	....	....	
13,000	52,000	.028500	.002200	....	....	
13,250	53,000	.030000	.001500	....	....	
13,500	54,000	.032350	.002350	....	....	
13,750	55,000	.034100	.001750	....	....	
14,000	56,000	.036750	.002650	....	....	
14,250	57,000	.039000	.002250	....	....	
14,500	58,000	.042000	.003000	....	....	
14,750	59,000	.044350	.002350	....	....	
15,000	60,000	.047500	.003150	....	....	
15,500	62,000	.055000	.007500	....	....	
16,000	64,000	.062500	.007500	....	....	
16,500	66,000	.0700	.0075	....	....	
17,000	68,000	.0800	.0100	....	....	
17,500	70,000	.1050	.0250	....	....	
17,960	71,840	.1750	.0700	....	....	Tensile strength.
16,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	71,840
Elastic limit per square inch of original section	do....	34,000
Elongation per inch after rupture	inch..	0.2700
Elongation per inch under strain at elastic limit	do....	.001350
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.6 from middle of stem
Character of broken surface		fine granular 60 per cent., silky 40 per cent.
Elongation of inch sections		″.37*, ″.17

No. 834.

Marks, $\begin{smallmatrix}2\,M\\10\,W\\T\end{smallmatrix}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000200	.000200	0.	....	
2, 500	10, 000	.000350	.000150	0.	....	
8, 750	15, 000	.000500	.000150	0.	....	
5, 000	20, 000	.000750	.000250	.000050	.000050	
6, 250	25, 000	.000900	.000150	.000100	.000050	
7, 500	30, 000	.001150	.000250	.000150	.000050	
7, 750	81, 000	.001200	.000050	....	....	
8, 000	82, 000	.001250	.000050	....	....	
8, 250	83, 000	.001300	.000050	....	....	Elastic limit.
8, 500	84, 000	.003150	.001850	....	....	
8, 750	85, 000	.010850	.007200	.009050	.008900	
9, 000	86, 000	.010800	.000450	....	....	
9, 250	87, 000	.011050	.000250	....	....	
9, 500	38, 000	.011700	.000650	....	....	
9, 750	89, 000	.012800	.001100	....	....	
10, 000	40, 000	.014300	.001500	.012750	.008700	
10, 250	41, 000	.015750	.001450	....	....	
10, 500	42, 000	.016850	.001100	....	....	
10, 750	48, 000	.018050	.001200	....	....	
11, 000	44, 000	.019500	.001450	....	....	
11, 250	45, 000	.020600	.001100	.018750	.006000	
11, 500	46, 000	.022600	.002000	....	....	
11, 750	47, 000	.023900	.001300	....	....	
12, 000	48, 000	.025900	.002000	....	....	
12, 250	49, 000	.027250	.001350	....	....	
12, 500	50, 000	.029000	.001750	.027000	.008250	
12, 750	51, 000	.030100	.001100	....	....	
18, 000	52, 000	.032900	.002800	....	....	
18, 250	53, 000	.085000	.002100	....	....	
18, 500	54, 000	.037600	.002600	....	....	
18, 750	55, 000	.039900	.002300	....	....	
14, 000	56, 000	.043000	.003100	....	....	
14, 250	57, 000	.045900	.002900	....	....	
14, 500	58, 000	.049250	.008350	....	....	
14, 750	59, 000	.052000	.002750	....	....	
15, 000	60, 000	.057000	.005000	....	....	
15, 500	62, 000	.066800	.009800	....	....	
16, 000	64, 000	.079500	.012700	....	....	
16, 500	66, 000	.1000	.0205	....	....	
17, 000	68, 000	.1350	.0350	....	....	
17, 160	68, 640	.1850	.0500	....	....	Tensile strength.
14, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	68, 640
Elastic limit per square inch of original section	do....	83, 000
Elongation per inch after rupture	inch..	0. 2950
Elongation per inch under strain at elastic limit	do....	.001300
Reduction in diameter at point of rupture	do....	.174
Reduction in area after rupture, per centum of original section		52. 2
Position of rupture		middle of stem
Character of broken surface		fine silky
Elongation of inch sections		″.34*, ″.25*

No. 835.

Marks, $\begin{smallmatrix}3 & \mathrm{M}\\ 10 & \mathrm{W}\\ & \mathrm{T}\end{smallmatrix}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000200	.000100	0.	....	
3, 750	15, 000	.000350	.000150	0.	....	
5, 000	20, 000	.000550	.000200	0.	....	
6, 250	25, 000	.000700	.000150	0.	....	
7, 500	30, 000	.000950	.000250	0.	....	
7, 750	31, 000	.001000	.000050	....	....	Elastic limit.
8, 000	32, 000	.002750	.001750	....	....	
8, 250	33, 000	.005650	.002900	....	....	
8, 500	34, 000	.006750	.001100	....	....	
8, 750	35, 000	.008400	.001650	.007150	.007150	
9, 000	36, 000	.009650	.001250	....	....	
9, 250	37, 000	.010850	.001200	....	....	
9, 500	38, 000	.011850	.001000	....	....	
9, 750	39, 000	.013000	.001150	....	....	
10, 000	40, 000	.014250	.001250	.012650	.005500	
10, 250	41, 000	.015950	.001700	....	....	
10, 500	42, 000	.016950	.001000	....	....	
10, 750	43, 000	.017650	.000700	....	....	
11, 000	44, 000	.019000	.001350	....	....	
11, 250	45, 000	.020250	.001250	.018500	.005850	
11, 500	46, 000	.021750	.001500	....	....	
11, 750	47, 000	.023250	.001500	....	....	
12, 000	48, 000	.025250	.002000	....	....	
12, 250	49, 000	.027100	.001850	....	....	
12, 500	50, 000	.028800	.001700	.026850	.008850	
12, 750	51, 000	.030200	.001400	....	....	
13, 000	52, 000	.033000	.002800	....	....	
13, 250	53, 000	.034850	.001850	....	....	
13, 500	54, 000	.037500	.002650	....	....	
13, 750	55, 000	.039600	.002100	....	....	
14, 000	56, 000	.042500	.002900	....	....	
14, 250	57, 000	.044700	.002200	....	....	
14, 500	58, 000	.049000	.004300	....	....	
14, 750	59, 000	.052000	.003000	....	....	
15, 000	60, 000	.055600	.003600	....	....	
15, 500	62, 000	.066000	.010400	....	....	
16, 000	64, 000	.077500	.011500	....	....	
16, 500	66, 000	.0950	.0175	....	....	
17, 000	68, 000	.1300	.0350	....	....	
17, 120	68, 480	.1500	.0200	....	....	
17, 180	68, 720	.1900	.0400	....	....	Tensile strength.
15, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7. 8630
Hardness	10. 69
Tensile strength per square inch of original section ....pounds .	68, 720
Elastic limit per square inch of original section ....do....	31, 000
Elongation per inch after rupture ....inch..	0. 2850
Elongation per inch under strain at elastic limit ....do....	.001000
Reduction in diameter at point of rupture ....do....	. 154
Reduction in area after rupture, per centum of original section	47.2
Position of rupture	″.1 from middle of stem
Character of broken surface	fine silky
Elongation of inch sections	″.38*, ″.19

No. 836.

Marks, $\overset{4\,M}{10\,\underset{T}{W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000300	.000150	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000750	.000150	0.	....	
7,500	30,000	.000950	.000200	0.	....	
7,750	31,000	.001000	.000050	....	....	
8,000	32,000	.001050	.000050	....	....	
8,250	33,000	.001100	.000050	....	....	Elastic limit.
8,500	34,000	.003800	.002700	....	....	
8,750	35,000	.009050	.005250	.007700	.007700	
9,000	36,000	.010600	.001550	....	....	
9,250	37,000	.010850	.000250	....	....	
9,500	38,000	.011700	.000850	....	....	
9,750	39,000	.012700	.001000	....	....	
10,000	40,000	.014250	.001550	.012700	.005000	
10,250	41,000	.015550	.001300	....	....	
10,500	42,000	.016500	.000950	....	....	
10,750	43,000	.017650	.001150	....	....	
11,000	44,000	.019200	.001550	....	....	
11,250	45,000	.020450	.001250	.018500	.005800	
11,500	46,000	.022050	.001600	....	....	
11,750	47,000	.023550	.001500	....	....	
12,000	48,000	.025300	.001750	....	....	
12,250	49,000	.027000	.001700	....	....	
12,500	50,000	.028900	.001900	.026800	.008300	
12,750	51,000	.030000	.001100	....	....	
13,000	52,000	.033050	.003050	....	....	
13,250	53,000	.035000	.001950	....	....	
13,500	54,000	.037350	.002250	....	....	
13,750	55,000	.039600	.002350	....	....	
14,000	56,000	.042500	.002900	....	....	
14,250	57,000	.044750	.002250	....	....	
14,500	58,000	.048050	.003300	....	....	
14,750	59,000	.051750	.003700	....	....	
15,000	60,000	.055500	.003750	....	....	
15,500	62,000	.065000	.009500	....	....	
16,000	64,000	.077500	.012500	....	....	
16,500	66,000	.1000	.0225	....	....	
17,000	68,000	.1350	.0350	....	....	
17,200	68,800	.1700	.0350	....	....	Tensile strength.
15,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	68,800
Elastic limit per square inch of original section	do....	33,000
Elongation per inch after rupture	inch..	0.2450
Elongation per inch under strain at elastic limit	do....	.001100
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		″.5 from neck
Character of broken surface		granular, 50 per cent.; dull silky irregular surface, 50 per cent.
Elongation of inch sections		″.34+, ″.15

No. 525.

Marks, $\overset{7\ M}{\underset{T}{10\ W}}$

Length 4″.5.

Diameter, ″.798.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000333	.000166	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	.000033	.000033	
12,500	25,000	.000833	.000166	.000033	0.	
15,000	30,000	.001000	.000167	.000067	.000034	Elastic limit.
15,500	31,000	.002000	.001000	....	....	
16,000	32,000	.005000	.003000	....	....	
16,500	33,000	.006200	.001200	....	....	
17,000	34,000	.008333	.002133	....	....	
17,500	35,000	.009667	.001334	.008333	.008266	
18,000	36,000	.010500	.000833	....	....	
18,500	37,000	.011367	.000867	....	....	
19,000	38,000	.012167	.000800	....	....	
19,500	39,000	.013367	.001200	....	....	
20,000	40,000	.014333	.000966	.012833	.004500	
34,140	68,280	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	30,000
Compression per inch under stress at elastic limit	inch..	0.001000
Ultimate strength per square inch of original section	pounds..	68,280
Manner of failure		triple flexure

No. 526.

Marks, $\overset{8\,\text{M}}{\underset{\text{T}}{10\,\text{W}}}$
Length, 4''.5.
Diameter, ''.798.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000033	.000033	0.	....	
5,000	10,000	.000233	.000200	0.	....	
7,500	15,000	.000400	.000167	0.	....	
10,000	20,000	.000600	.000200	0.	....	
12,500	25,000	.000800	.000200	.000033	.000033	
13,000	26,000	.000833	.000033	....	....	
13,500	27,000	.000867	.000034	....	....	
14,000	28,000	.000900	.000033	....	....	
14,500	29,000	.000933	.000033	....	....	
15,000	30,000	.001000	.000067	.000100	000067	Elastic limit.
15,500	31,000	.001167	.000167	....	....	
16,000	32,000	.004867	.003700	....	....	
16,500	33,000	.006767	.001900	....	....	
17,000	34,000	.008200	.001433	....	....	
17,500	35,000	.008800	.000600	.007567	.007467	
18,000	36,000	.009900	.001100	....	....	
18,500	37,000	.010833	.000933	....	....	
19,000	38,000	.011700	.000867	....	....	
19,500	39,000	.012467	.000767	....	....	
20,000	40,000	.013567	.001100	.012100	.004533	
34,480	68,960	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	30,000
Compression per inch under stress at elastic limit	inch..	0.001000
Ultimate strength per square inch of original section	pounds..	68,960
Manner of failure		triple flexure

No. 521.

Compression Test.

Marks, $\begin{smallmatrix}5\ \mathrm{M}\\ 10\ \mathrm{W}\\ \mathrm{T}\end{smallmatrix}$

Length, 10″.03.

Diameter, 1″.002.

Sectional area, .787 square inch.

Shortened 1 per cent. of length and afterwards tested by tension.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
787	1,000	0.	0.	0.	0.	Initial load.
3,935	5,000	.000140	.000140	.000000	.000000	
7,870	10,000	.000320	.000180	.000020	.000020	
11,805	15,000	.000460	.000140	.000020	0.	
15,740	20,000	.000620	.000160	.000040	.000020	
19,675	25,000	.000800	.000180	.000040	0.	
20,462	26,000	.000840	.000040	....	....	
21,249	27,000	.000860	.000020	....	....	
22,036	28,000	.000900	.000040	....	....	
22,823	29,000	.000960	.000060	....	....	
23,610	30,000	.001000	.000040	.000060	.000020	
24,397	31,000	.001060	.000060	....	....	Elastic limit.
25,184	32,000	.001060	.001000	....	....	
25,971	33,000	.008000	.006940	....	....	
28,300	35,960	.01	.002000	....	....	Test discontinued.

General summary.

Elastic limit per square inch of original section .... pounds.. 31,000
Compression per inch under stress at elastic limit .... inch.. 0.001060
Manner of failure .... deflected at the middle ″.04

No. 839.

Tension Test.

Previously shortened 1 per cent. by compression.

Marks, $\underset{T}{\overset{5M}{10W}}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	.000017	.000017	
3,750	15,000	.000467	.000150	.000033	.000016	
5,000	20,000	.000633	.000166	.000067	.000084	Elastic limit.
5,250	21,000	.000700	.000067	....	....	
5,500	22,000	.000817	.000117	....	....	
5,750	23,000	.000983	.000166	....	....	
6,000	24,000	.001250	.000267	....	....	
6,250	25,000	.001450	.000200	.000700	.000633	
6,500	26,000	.001883	.000433	....	....	
6,750	27,000	.002250	.000367	....	....	
7,000	28,000	.002733	.000483	....	....	
7,250	29,000	.003167	.000434	....	....	
7,500	30,000	.003800	.000633	.002817	.002117	
7,750	31,000	.004338	.000533	....	....	
8,000	32,000	.005000	.000667	....	....	
8,250	33,000	.005917	.000917	....	....	
8,500	34,000	.006917	.001000	....	....	
8,750	35,000	.007467	.000550	.006250	.003433	
9,000	36,000	.008683	.001216	....	....	
9,250	37,000	.009300	.000617	....	....	
9,500	38,000	.010667	.001367	....	....	
9,750	39,000	.011667	.001000	....	....	
10,000	40,000	.013083	.001416	.011750	.005500	
10,500	42,000	.015850	.000767	....	....	
11,000	44,000	.018417	.002567	....	....	
11,500	46,000	.021750	.003333	....	....	
12,000	48,000	.025333	.003583	....	....	
12,500	50,000	.029833	.004500	....	....	
13,000	52,000	.0333	.003467	....	....	
13,500	54,000	.0383	.0050	....	....	
14,000	56,000	.0467	.0084	....	....	
14,500	58,000	.0533	.0066	....	....	
15,000	60,000	.0633	.0100	....	....	
15,500	62,000	.0767	.0134	....	....	
16,000	64,000	.1017	.0250	....	....	
16,500	66,000	.1433	.0416	....	....	
16,610	66,440	.2000	.0567	....	....	Tensile strength.
14,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	66,440
Elastic limit per square inch of original section	do	20,000
Elongation per inch after rupture	inch	0.2483
Elongation per inch under strain at elastic limit	do	.000633
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		″.9 from middle of stem
Character of broken surface		fine silky7
Elongation of inch sections		″.16, ″.23, ″.47*, ″.25, ″.21, ″.1

No. 522.

Compression Test.

Marks, $\overset{6\,M}{\underset{T}{10\,W}}$
Length, 10''.03.
Diameter, 1''.002.
Sectional area, .787 square inch.
Shortened 1 per cent. of length and afterwards tested by tension.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
787	1,000	0.	0.	0.	0.	Initial load.
3,935	5,000	.000120	.000120	0.	....	
7,870	10,000	.000280	.000100	0.	....	
11,805	15,000	.000420	.000140	0.	....	
15,740	20,000	.000600	.000180	0.	....	
19,675	25,000	.000760	.000160	0.	....	
20,462	26,000	.000800	.000040	....	....	
21,249	27,000	.000820	.000020	....	....	
22,036	28,000	.000860	.000040	....	....	
22,823	29,000	.000880	.000020	....	....	
23,610	30,000	.000900	.000020	.000020	.000020	
24,397	31,000	.000960	.000060	....	....	
25,184	32,000	.001000	.000040	....	....	
25,971	33,000	.001040	.000040	....	....	Elastic limit.
26,758	34,000	.008100	.007060	....	....	
29,900	37,990	.01	.001900	....	....	Test discontinued.

General summary.

Elastic limit per square inch of original section..........pounds.. 33,000
Compression per inch under stress at elastic limit..........inch.. 0.001040
Manner of failure..........deflected at the middle ''.05

No. 840.

Tension Test.

Previously shortened 1 per cent. by compression
Marks, $\underset{\mathrm{T}}{{}^{6}_{10}\frac{\mathrm{M}}{\mathrm{W}}}$
Diameter, ″.564.
Sectional area, .25 square inch.

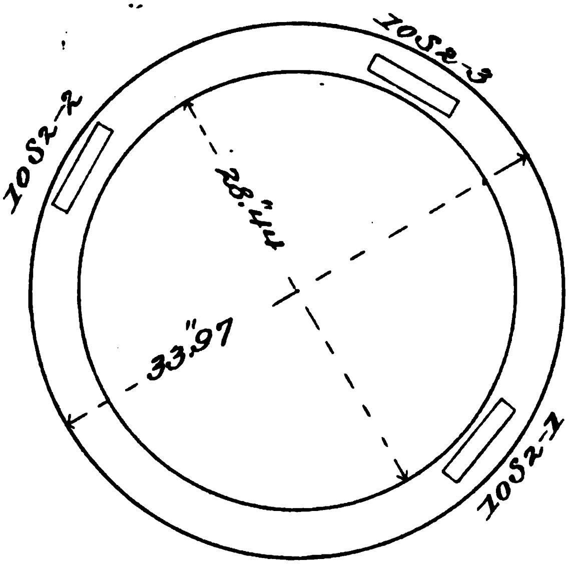
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	—.000017	—.000017	
3,750	15,000	.000383	.000183	—.000017	0.	
5,000	20,000	.000533	.000150	—.000017	0.	
5,250	21,000	.000567	.000034	....	....	Elastic limit.
5,500	22,000	.000650	.000083	....	....	
5,750	23,000	.000817	.000167	....	....	
6,000	24,000	.000967	.000150	....	....	
6,250	25,000	.001050	.000083	.000350	.000367	
6,500	26,000	.001333	.000283	....	....	
6,750	27,000	.001583	.000250	....	....	
7,000	28,000	.001883	.000300	....	....	
7,250	29,000	.002317	.000434	....	....	
7,500	30,000	.002800	.000483	.001867	.001517	
7,750	31,000	.003333	.000533	....	....	
8,000	32,000	.003917	.000584	....	....	
8,250	33,000	004583	.000666	....	....	
8,500	34,000	.005333	.000750	....	....	
8,750	35,000	.005967	.000634	.004967	.003100	
9,000	36,000	.006833	.000866	....	....	
9,250	37,000	.007567	.000734	....	....	
9,500	38,000	.008583	.001016	....	....	
9,750	39,000	.009500	.000917	....	....	
10,000	40,000	.010883	.001383	.009450	.004483	
10,500	42,000	.012350	.001467	....	....	
11,000	44,000	.015250	.002900	....	....	
11,500	46,000	.018333	.003083	....	....	
12,000	48,000	.021667	.003334	....	....	
12,500	50,000	.024833	.003166	....	....	
13,000	52,000	.0300	.005167	....	....	
13,500	54,000	.0350	.0050	....	....	
14,000	56,000	.0383	.0033	....	....	
14,500	58,000	.0467	.0084	....	....	
15,000	60,000	.0567	.0100	....	....	
15,500	62,000	.0667	.0100	....	....	
16,000	64,000	.0800	.0133	....	....	
16,500	66,000	.1033	.0233	....	....	
17,000	68,000	.1467	.0434	....	....	
17,040	68,160	.1800	.0333	....	....	Tensile strength.
14,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds.. 68,160
Elastic limit per square inch of original section....................do.... 21,000
Elongation per inch after rupture....................inch.. 0.2167
Elongation per inch under strain at elastic limit....................do.... .000567
Reduction in diameter at point of rupture....................do.... .154
Reduction in area after rupture, per centum of original section.................... 47.2
Position of rupture.................... 1″.5 from neck
Character of broken surface.................... silky
Elongation of inch sections....................″.22, ″.43*, ″.20, ″.19, ″.15, ″.11

10" Steel wire-wound Rifle

Sleeve



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No. 926.

Marks, $^{10\,S_3}_{\;\;1}$

Diameter, ″.564.

Sectional area. .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.		
2,500	10,000	.000333	.000166	0.		
3,750	15,000	.000500	.000167	0.		
5,000	20,000	.000633	.000133	0.		
6,250	25,000	.000767	.000134	0.		
7,500	30,000	.000933	.000166	0.		
8,750	35,000	.001067	.000134	0.		
10,000	40,000	.001267	.000200	.000033	.000033	
10,250	41,000	.001300	.000033			
10,500	42,000	.001333	.000033			
10,750	43,000	.001367	.000034			
11,000	44,000	.001400	.000033			
11,250	45,000	.001433	.000033	.000033	0.	
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	49,000	.001567	.000034			
12,500	50,000	.001600	.000033	.000067	.000034	
12,750	51,000	.001667	.000067			
13,000	52,000	.001733	.000066			
13,250	53,000	.001833	.000100			
13,500	54,000	.001933	.000100			
13,750	55,000	.002000	.000067	.000367	.000300	Elastic limit.
14,000	56,000	.002167	.000167			
14,250	57,000	.002500	.000333			
14,500	58,000	.002833	.000333			
14,750	59,000	.0[illegible]33	.000500			
15,000	60,000	.0[illegible]	.000500	.001833	.001466	
15,500	62,000	.00[illegible]	.000834			
16,000	64,000	.005567	.000900			
16,500	66,000	.007500	.001933			
17,000	68,000	.0091[illegible]	.001633			
17,500	70,000	.010533	.001400			
18,000	72,000	.012333	.001800			
18,500	74,000	.013900	.001567			
19,000	76,000	.016000	.002100			
19,500	78,000	.018367	.002367			
20,000	80,000	.020000	.001633			
20,500	82,000	.022333	.002333			
21,000	84,000	.024500	.002167			
21,500	86,000	.027267	.002767			
22,000	88,000	.030000	.002733			
22,500	90,000	.033100	.003100			
23,000	92,000	.037067	.003967			
23,500	94,000	.040600	.003533			
24,000	96,000	.045333	.004733			
24,500	98,000	.050333	.005000			
25,000	100,000	.058000	.007667			
25,500	102,000	.0667	.0087			
26,000	104,000	.0900	.0233			
26,030	104,120	.1000	.0100			Tensile strength.

General summary.

Specific gravity	7.8411
Hardness	15.83
Tensile strength per square inch of original section .... pounds..	104,120
Elastic limit per square inch of original section .... do....	55,000
Elongation per inch after rupture .... inch..	0.1367
Elongation per inch under strain at elastic limit .... do....	.002000
Reduction in diameter at point of rupture .... do....	.074
Reduction in area after rupture, per centum of original section	24.6
Position of rupture	″.8 from neck

Character of broken surface, granular, dull spot at circumference, surface cracks developed in cylindrical surface of stem.

Elongation of inch sections .... ″.23*, ″.11, ″.07

No. 927.

Marks, $^{10\,S_2}_{2}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001233	.000133	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001400	0.	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001500	.000033	....	....	
12,500	50,000	.001567	.000067	.000033	.000033	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001800	.000100	.000067	.000034	
14,000	56,000	.001833	.000033	....	....	
14,250	57,000	.001900	.000067	....	....	Elastic limit.
14,500	58,000	.002033	.000133	....	....	
14,750	59,000	.004600	.002567	....	....	
15,000	60,000	.005433	.000833	.003267	.003200	
15,500	62,000	.006100	.000667	....	....	
16,000	64,000	.007733	.001633	....	....	
16,500	66,000	.009167	.001434	....	....	
17,000	68,000	.010900	.001733	....	....	
17,500	70,000	.012600	.001700	....	....	
18,000	72,000	.014833	.002233	....	....	
18,500	74,000	.016667	.001834	....	....	
19,000	76,000	.018533	.001866	....	....	
19,500	78,000	.020500	.001967	....	....	
20,000	80,000	.023000	.002500	....	....	
20,500	82,000	.025667	.002667	....	....	
21,000	84,000	.028333	.002666	....	....	
21,500	86,000	.031333	.003000	....	....	
22,000	88,000	.035000	.003667	....	....	
22,500	90,000	.038000	.003000	....	....	
23,000	92,000	.041833	.003833	....	....	
23,500	94,000	.046667	.004834	....	....	
24,000	96,000	.055667	.009000	....	....	
24,500	98,000	.063200	.007533	....	....	
25,000	100,000	.0733	.0101	....	....	
25,500	102,000	.1067	.0334	....	....	Tensile strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,000
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1″ from neck
Character of broken surface		silky
Elongation of inch sections		″.23*, ″.15, ″.08

No. 928.

Marks, $^{10}{}_{8}S_2$
Diameter, .″564.
Sectional area, .25 square inch.

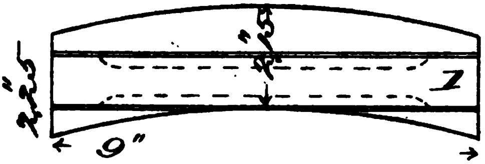
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	.000033	.000033	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000033	.0	
11,500	46,000	.001400	0.	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001533	.000066	....	....	
12,500	50,000	.001567	.000034	.000033	.0	
12,750	51,000	.001600	.000033	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001733	.000066	....	....	
13,750	55,000	.001800	.000067	.000067	.000034	
14,000	56,000	.001867	.000067	....	....	Elastic limit.
14,250	57,000	.002033	.000166	....	....	
14,500	58,000	.002900	.000867	....	....	
14,750	59,000	.004033	.001133	....	....	
15,000	60,000	.005067	.001034	.002933	.002866	
15,500	62,000	.006233	.001166	....	....	
16,000	64,000	.007233	.001000	....	....	
16,500	66,000	.009000	.001767	....	....	
17,000	68,000	.010300	.001600	....	....	
17,500	70,000	.012267	.001667	....	....	
18,000	72,000	.014333	.002066	....	....	
18,500	74,000	.016833	.002500	....	....	
19,000	76,000	.018333	.001500	....	....	
19,500	78,000	.020667	.002334	....	....	
20,000	80,000	.022833	.002166	....	....	
20,500	82,000	.025367	.002534	....	....	
21,000	84,000	.027800	.002433	....	....	
21,500	86,000	.030267	.002467	....	....	
22,000	88,000	.033733	.003466	....	....	
22,500	90,000	.037433	.003700	....	....	
23,000	92,000	.042767	.005334	....	....	
23,500	94,000	.048333	.005566	....	....	
24,000	96,000	.055000	.006667	....	....	
24,500	98,000	.063000	.008000	....	....	
25,000	100,000	.0767	.0137	....	....	
25,430	101,720	.1067	.0300	....	....	Tensile strength.
23,400	....	....	....	....	....	Load at time of rupture.

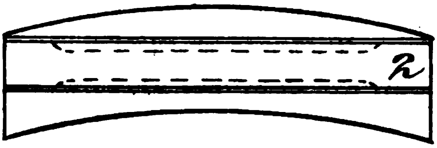
General summary.

Tensile strength per square inch of original section....................pounds.. 101,720
Elastic limit per square inch of original section....................do.... 56,000
Elongation per inch after rupture....................inch.. 0.1567
Elongation per inch under strain at elastic limit....................do.... .001867
Reduction in diameter at point of rupture....................do.... .104
Reduction in area after rupture, per centum of original section.................... 33.5
Position of rupture....................″.55 from neck
Character of broken surface....................silky, traces of granulation.
Elongation of inch sections....................″.28*, ″.10, ″.09

10" Steel wire-wound Rifle.

Specimens from trunnion ring
Whitworth Steel.





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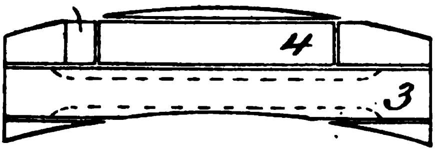


No. 636.

Mark, I
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000650	.000200	.000067	.000067	
5,250	21,000	.000700	.000050	....	....	
5,500	22,000	.000783	.000083	....	....	
5,750	23,000	.000833	.000050	....	....	
6,000	24,000	.000900	.000067	....	....	
6,250	25,000	.000950	.000050	.000167	.000100	
6,500	26,000	.001000	.000050	....	....	
6,750	27,000	.001033	.000033	....	....	
7,000	28,000	.001100	.000067	....	....	
7,250	29,000	.001150	.000050	....	....	
7,500	30,000	.001217	.000067	.000283	.000116	
7,750	31,000	.001267	.000050	....	....	
8,000	32,000	.001317	.000050	....	....	
8,250	33,000	.001383	.000066	....	....	
8,500	34,000	.001467	.000084	....	....	
8,750	35,000	.001533	.000066	.000417	.000134	
9,000	36,000	.001633	.000100	....	....	
9,250	37,000	.001683	.000050	....	....	
9,500	38,000	.001800	.000117	....	....	
9,750	39,000	.001883	.000083	....	....	
10,000	40,000	.001967	.000084	.000617	.000200	
10,250	41,000	.002050	.000083	....	....	Probable elastic limit.
10,500	42,000	.002150	.000100	....	....	
10,750	43,000	.002267	.000117	....	....	
11,000	44,000	.002450	.000183	....	....	
11,250	45,000	.002533	.000083	.000983	.000366	
11,500	46,000	.002750	.000217	....	....	
11,750	47,000	.002883	.000133	....	....	
12,000	48,000	.003117	.000234	....	....	
12,250	49,000	.003300	.000183	....	....	
12,500	50,000	.003617	.000317	.001867	.000884	
12,750	51,000	.003983	.000366	....	....	
13,000	52,000	.004383	.000400	....	....	
13,250	53,000	.004633	.000250	....	....	
13,500	54,000	.005167	.000534	....	....	
13,750	55,000	.005450	.000283	....	....	
14,000	56,000	.006133	.000683	....	....	
14,250	57,000	.006750	.000617	....	....	
14,500	58,000	.008000	.001250	....	....	
14,750	59,000	.008400	.000400	....	....	
15,000	60,000	.008833	.000433	....	....	
15,500	62,000	.010633	.001800	....	....	
16,000	64,000	.012500	.001867	....	....	
16,500	66,000	.014517	.002017	....	....	
17,000	68,000	.016333	.001816	....	....	
17,500	70,000	.018333	.002000	....	....	
18,000	72,000	.021083	.002750	....	....	
18,500	74,000	.023500	.002417	....	....	
19,000	76,000	.026133	.002633	....	....	
19,500	78,000	.029917	.003784	....	....	
20,000	80,000	.032550	.002633	....	....	
20,500	82,000	.036633	.004083	....	....	
21,000	84,000	.040683	.004050	....	....	
21,500	86,000	.045833	.005150	....	....	
22,000	88,000	.053333	.007500	....	....	
22,500	90,000	.0667	.013367	....	....	
23,000	92,000	.0783	.0116	....	....	
23,200	92,800	.1033	.0250	....	....	Tensile strength.
19,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	92,800
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.1267
Elongation per inch under strain at elastic limit	do....	.002050
Reduction in diameter at point of rupture	do....	.154
Reduction in area after rupture, per centum of original section		47.2
Position of rupture		".70 from neck
Character of broken surface		silky; cup-shaped ends
Elongation of inch sections		".36*, ".11, ".06, ".06, ".08, ".09

No. 635.

Mark, 2
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0,		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000650	.000200	.000017	.000017	
5,250	21,000	.000683	.000033			
5,500	22,000	.000733	.000050			
5,750	23,000	.000767	.000034			
6,000	24,000	.000817	.000050			
6,250	25,000	.000850	.000033	.000067	.000050	
6,500	26,000	.000900	.000050			
6,750	27,000	.000933	.000033			
7,000	28,000	.000983	.000050			
7,250	29,000	.001017	.000034			
7,500	30,000	.001067	.000050	.000133	.000066	
7,750	31,000	.001117	.000050			
8,000	32,000	.001167	.000050			
8,250	33,000	.001200	.000033			
8,500	34,000	.001267	.000067			
8,750	35,000	.001333	.000066	.000200	.000067	
9,000	36,000	.001400	.000067			
9,250	37,000	.001450	.000050			
9,500	38,000	.001517	.000067			
9,750	39,000	.001583	.000066			
10,000	40,000	.001667	.000084	.000350	0.000150	
10,250	41,000	.001750	.000083			
10,500	42,000	.001883	.000133			
10,750	43,000	.001967	.000084			Probable elastic limit.
11,000	44,000	.002117	.000150			
11,250	45,000	.002283	.000166	.000683	.000333	
11,500	46,000	.002550	.000267			
11,750	47,000	.002817	.000267			
12,000	48,000	.003300	.000483			
12,250	49,000	.003717	.000417			
12,500	50,000	.004500	.000783	.002600	.001917	
12,750	51,000	.004867	.000367			
13,000	52,000	.005367	.000500			
13,250	53,000	.006000	.000633			
13,500	54,000	.006750	.000750			
13,750	55,000	.007500	.000750			
14,000	56,000	.008333	.000833			
14,250	57,000	.009017	.000684			
14,500	58,000	.010083	.001066			
14,750	59,000	.010850	.000767			
15,000	60,000	.012000	.001150			
15,500	62,000	.013583	.001583			
16,000	64,000	.015833	.002250			
16,500	66,000	.017750	.001917			
17,000	68,000	.020000	.002250			
17,500	70,000	.022500	.002500			
18,000	72,000	.025750	.003250			
18,500	74,000	.028500	.002750			
19,000	76,000	.032167	.003667			
19,500	78,000	.035667	.003500			
20,000	80,000	.039417	.003750			
20,500	82,000	.045167	.005750			
21,000	84,000	.051667	.006500			
21,500	86,000	.0617	.010633			
22,000	88,000	.0717	.0100			
22,500	90,000	.0867	.0150			
22,820	91,280	.1250	.0383			Tensile strength.
19,500						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	91,280
Elastic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.1650
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		″.90 from neck
Character of broken surface		silky
Elongation of inch sections		″.36*, ″.16, ″.10, ″10, ″.13, ″.14

No. 634.

Mark, 3
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	.000017	.000017	
3,750	15,000	.000517	.000200	.000050	.000033	
5,000	20,000	.000717	.000200	.000100	.000050	
5,250	21,000	.000783	.000066	....	....	
5,500	22,000	.000833	.000050	....	....	
5,750	23,000	.000883	.000050	....	....	
6,000	24,000	.000933	.000050	....	....	
6,250	25,000	.001000	.000067	.000183	.000083	
6,500	26,000	.001083	.000083	....	....	
6,750	27,000	.001117	.000034	....	....	
7,000	28,000	.001150	.000033	....	....	
7,250	29,000	.001183	.000033	....	....	
7,500	30,000	.001250	.000067	.000300	.000117	
7,750	31,000	.001300	.000050	....	....	
8,000	32,000	.001350	.000050	....	....	
8,250	33,000	.001417	.000067	....	....	
8,500	34,000	.001483	.000066	....	....	
8,750	35,000	.001533	.000050	.000417	.000117	
9,000	36,000	.001650	.000117	....	....	
9,250	37,000	.001700	.000050	....	....	
9,500	38,000	.001767	.000067	....	....	Probable elastic limit.
9,750	39,000	.001867	.000100	....	....	
10,000	40,000	.001983	.000116	.000633	.000216	
10,250	41,000	.002067	.000084	....	....	
10,500	42,000	.002200	.000133	....	....	
10,750	43,000	.002283	.000083	....	....	
11,000	44,000	.002467	.000184	....	....	
11,250	45,000	.002600	.000133	.001050	.000417	
11,500	46,000	.002817	.000217	....	....	
11,750	47,000	.003033	.000216	....	....	
12,000	48,000	.003283	.000250	....	....	
12,250	49,000	.003450	.000167	....	....	
12,500	50,000	.004133	.000683	.002338	.001283	
12,750	51,000	.004333	.000200	....	....	
13,000	52,000	.004750	.000417	....	....	
13,250	53,000	.005250	.000500	....	....	
13,500	54,000	.006033	.000783	....	....	
13,750	55,000	.006667	.000634	....	....	
14,000	56,000	.007417	.000750	....	....	
14,250	57,000	.008100	.000683	....	....	
14,500	58,000	.008833	.000733	....	....	
14,750	59,000	.009750	.000917	....	....	
15,000	60,000	.010667	.000917	....	....	
15,500	62,000	.012583	.001916	....	....	
16,000	64,000	.014333	.001750	....	....	
16,500	66,000	.016217	.001884	....	....	
17,000	68,000	.016833	.000616	....	....	
17,500	70,000	.021000	.004167	....	....	
18,000	72,000	.023000	.002000	....	....	
18,500	74,000	.025583	.002583	....	....	
19,000	76,000	.028750	.003167	....	....	
19,500	78,000	.031500	.002750	....	....	
20,000	80,000	.035583	.004083	....	....	
20,500	82,000	.039833	.004250	....	....	
21,000	84,000	.044333	.004500	....	....	
21,500	86,000	.050417	.006084	....	....	
22,000	88,000	.0583	.007883	....	....	
22,500	90,000	.0717	.0134	....	....	
23,000	92,000	.0883	.0166	....	....	
23,300	93,200	.1217	.0334	....	....	Tensile strength.
19,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	93,200
Elastic limit per square inch of original section	do ...	38,000
Elongation per inch after rupture	inch..	0.1650
Elongation per inch under strain at elastic limit	do	.001767
Reduction in diameter at point of rupture	do	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		1".00 from neck
Character of broken surface		silky
Elongation of inch sections		".83*, ".20, ".16, ".12, ".10, ".08

No. 504.

Mark, 4
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.

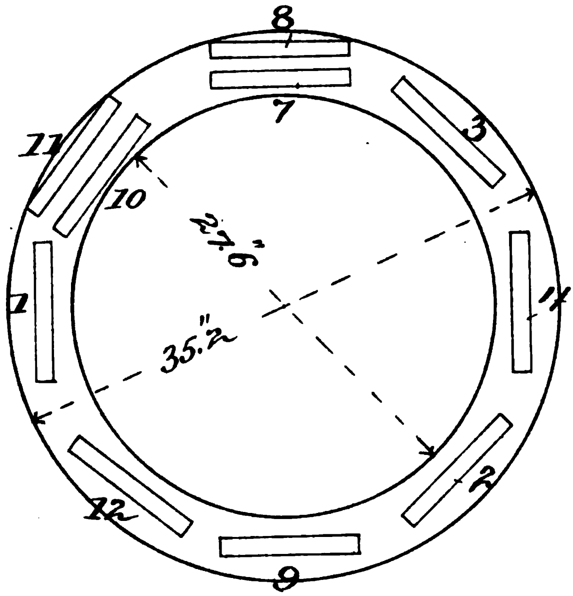
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000267	.000100	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000567	.000134	0.	....	
10,500	21,000	.000600	.000033	....	....	
11,000	22,000	.000633	.000033	....	....	
11,500	23,000	.000667	.000034	....	....	
12,000	24,000	.000667	0.	....	....	
12,500	25,000	.000700	.000033	.000033	.000033	
13,000	26,000	.000733	.000033	....	....	
13,500	27,000	.000767	.000034	....	....	
14,000	28,000	.000833	.000066	....	....	
14,500	29,000	.000833	0.	....	....	
15,000	30,000	.000867	.000034	.000033	0.	
15,500	31,000	.000933	.000066	....	....	
16,000	32,000	.000967	.000034	....	....	
16,500	33,000	.001000	.000033	....	....	
17,000	34,000	.001000	0.	....	....	
17,500	35,000	.001033	.000033	.000033	0.	
18,000	36,000	.001067	.000034	....	....	
18,500	37,000	.001100	.000033	....	....	
19,000	38,000	.001133	.000033	....	....	
19,500	39,000	.001167	.000034	....	....	
20,000	40,000	.001200	.000033	.000033	0.	
20,500	41,000	.001233	.000033	....	....	
21,000	42,000	.001267	.000034	....	....	
21,500	43,000	.001300	.000033	....	....	
22,000	44,000	.001333	.000033	....	....	Elastic limit.
22,500	45,000	.001633	.000300	.000300	.000267	
23,000	46,000	.002133	.000500	....	....	
23,500	47,000	.003167	.001034	....	....	
24,000	48,000	.003533	.000366	....	....	
24,500	49,000	.004067	.000534	....	....	
25,000	50,000	.004567	.000500	.003000	.002700	
25,500	51,000	.004900	.000333	....	....	
26,000	52,000	.005333	.000433	....	....	
26,500	53,000	.006000	.000667	....	......	
27,000	54,000	.006567	.000567	....	....	
27,500	55,000	.007167	.000600	.005400	.002400	
28,000	56,000	.007833	.000666	....	....	
28,500	57,000	.008233	.000400	....	....	
29,000	58,000	.008733	.000500	....	....	
29,500	59,000	.009433	.000700	....	....	
30,000	60,000	.010033	.000600	.008133	.002733	
41,580	83,160	....	....	....	....	Ultimate strength.

General summary.

Specific gravity	7.8682
Hardness	16.23
Elastic limit per square inch of original section ......pounds..	44,000
Compression per inch under stress at elastic limit ......inch .	0.001333
Ultimate strength per square inch of original section ......pounds..	83,160
Manner of failure	triple flexure

10" Steel wire-wound Rifle

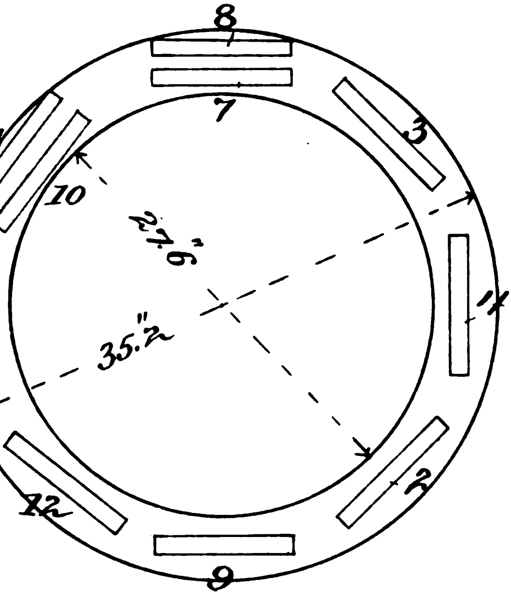
Hoop No. 8



Specimens 10, 11, and 12 taken out after retreatment.

teel wire-wound Rifle

Hoop No.8



imens 10, 11, and 12 taken
after retreatment.

No. 491.

Tension Test.

Marks on bar, $^{10}\frac{\text{R}}{2}$.
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000017	.000017	
2,500	10,000	.000333	.000166	.000017	0.	
3,750	15,000	.000500	.000167	.000017	0.	
5,000	20,000	.000650	.000150	.000017	0.	
6,250	25,000	.000800	.000150	.000033	.000016	
7,500	30,000	.000950	.000150	.000033	0.	
8,750	35,000	.001117	.000167	.000033	0.	
10,000	40,000	.001283	.000166	.000050	.000017	
10,250	41,000	.001300	.000017	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001350	.000017	....	....	
11,000	44,000	.001417	.000067	....	....	
11,250	45,000	.001467	.000050	.000067	.000017	Elastic limit.
11,500	46,000	.001550	.000083	....	....	
11,750	47,000	.001917	.000367	....	....	
12,000	48,000	.002933	.001016	....	....	
12,250	49,000	.003300	.000367	....	....	
12,500	50,000	.004083	.000583	.002317	.002250	
12,750	51,000	.004467	.000384	....	....	
13,000	52,000	.004867	.000400	....	....	
13,250	53,000	.005367	.000500	....	....	
13,500	54,000	.006250	.000883	....	....	
13,750	55,000	.006900	.000650	.004900	.002583	
14,000	56,000	.007667	.000767	....	....	
14,250	57,000	.008317	.000650	....	....	
14,500	58,000	.009133	.000816	....	....	
14,750	59,000	.009950	.000817	....	....	
15,000	60,000	.011017	.001067	.006700	.003800	
15,500	62,000	.012417	.001400	....	....	
16,000	64,000	.013883	.001466	....	....	
16,500	66,000	.016033	.002150	....	....	
17,000	68,000	.017950	.001917	....	....	
17,500	70,000	.019900	.001950	....	....	
18,000	72,000	.022467	.002567	....	....	
18,500	74,000	.024683	.002216	....	....	
19,000	76,000	.027333	.002650	....	....	
19,500	78,000	.030083	.002750	....	....	
20,000	80,000	.033017	.002934	....	....	
20,500	82,000	.036333	.003316	....	....	
21,000	84,000	.040367	.004034	....	....	
21,500	86,000	.045000	.004633	....	....	
22,000	88,000	.050533	.005533	....	....	
22,500	90,000	.058333	.007800	....	....	
23,000	92,000	.0683	.009967	....	....	
23,500	94,000	.0833	.0150	....	....	
23,800	95,200	.1067	.0234	....	....	Ultimate strength.
21,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..............................pounds.. 95,200
Elastic limit per square inch of original section..............................do.... 45,000
Elongation per inch after rupture..............................inch.. 0.1517
Elongation per inch under strain at elastic limit..............................do.... .001467
Reduction in diameter at point of rupture..............................do.... .134
Reduction in area after rupture, per centum of original section.............................. 41.9
Position of rupture..............................2" from neck
Character of broken surface..............................dull, spongy 100 per cent.
Elongation of inch sections.............................. ".11 (".33 fractured section), ".17, ".12, ".09, ".07

No. 492.

Tension Test.

Marks on bar, $^{10}R^{8}_{8}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	.000017	.000017	
3,750	15,000	.000467	.000150	.000017	0.	
5,000	20,000	.000617	.000150	.000017	0.	
6,250	25,000	.000733	.000116	.000017	0.	
7,500	30,000	.000917	.000184	.000017	0.	
8,750	35,000	.001067	.000150	.000017	0.	
10,000	40,000	.001233	.000166	.000017	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000033	.000016	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001533	.000066	....	....	
12,000	48,000	.001583	.000050	....	....	Elastic limit.
12,250	49,000	.001750	.000167	....	....	
12,500	50,000	.002617	.000867	.000900	.000867	
12,750	51,000	.002867	.000250	....	....	
13,000	52,000	.003217	.000350	....	....	
13,250	53,000	.003767	.000550	....	....	
13,500	54,000	.004400	.000633	....	....	
13,750	55,000	.005017	.000617	.003033	.002133	
14,000	56,000	.005650	.000633	....	....	
14,250	57,000	.006133	.000483	....	....	
14,500	58,000	.006867	.000734	....	....	
14,750	59,000	.007517	.000650	....	....	
15,000	60,000	.008467	.000950	.006200	.003167	
15,500	62,000	.009717	.001250	....	....	
16,000	64,000	.011467	.001750	....	....	
16,500	66,000	.013083	.001616	....	....	
17,000	68,000	.014767	.001684	....	....	
17,500	70,000	.016667	.001900	....	....	
18,000	72,000	.018533	.001866	....	....	
18,500	74,000	.020667	.002134	....	....	
19,000	76,000	.022750	.002083	....	....	
19,500	78,000	.025167	.002417	....	....	
20,000	80,000	.027567	.002400	....	....	
20,500	82,000	.030367	.002800	....	....	
21,000	84,000	.033350	.002983	....	....	
21,500	86,000	.036667	.003317	....	....	
22,000	88,000	.040667	.004000	....	....	
22,500	90,000	.045167	.004500	....	....	
23,000	92,000	.050333	.005166	....	....	
23,500	94,000	.057333	.007000	....	....	
24,000	96,000	.0683	.010967	....	....	
24,500	98,000	.0817	.0134	....	....	
25,000	100,000	.1100	.0283	....	....	Ultimate strength.
22,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 100,000
Elastic limit per square inch of original section..do ... 48,000
Elongation per inch after rupture...inch.. 0.1500
Elongation per inch under strain at elastic limit..do.... .001583
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section 36.4
Position of rupture..″.50 from middle of stem
Character of broken surface ....dull, spongy, granular at circumference
Elongation of inch sections..........................″.10, ″.14 (″.30 fractured section), ″.14, ″.12, ″.10

No. 658.

Marks, $^{10}\frac{R_s}{4}$

Diameter, ″.564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000300	.000300	.000067	.000067	
2,500	10,000	.000500	.000200	.000083	.000016	
3,750	15,000	.000683	.000183	.000083	0.	
5,000	20,000	.000850	.000167	.000100	.000017	
6,250	25,000	.001017	.000167	.000100	0.	
7,500	30,000	.001183	.000166	.000117	.000017	
7,750	31,000	.001217	.000034	....	....	
8,000	32,000	.001250	.000033	....	....	
8,250	33,000	.001283	.000033	....	....	
8,500	34,000	.001317	.000034	....	....	
8,750	35,000	.001350	.000033	.000117	0.	
9,000	36,000	.001383	.000033	....	....	
9,250	37,000	.001417	.000034	....	....	
9,500	38,000	.001450	.000033	....	....	
9,750	39,000	.001483	.000033	....	....	
10,000	40,000	.001533	.000050	.000133	.000016	
10,250	41,000	.001550	.000017	....	....	
10,500	42,000	.001600	.000050	....	....	
10,750	43,000	.001633	.000033	....	....	
11,000	44,000	.001667	.000034	....	....	
11,250	45,000	.001683	.000016	.000133	0.	Elastic limit.
11,500	46,000	.001783	.000100	....	....	
11,750	47,000	.001867	.000084	....	....	
12,000	48,000	.002200	.000333	....	....	
12,250	49,000	.002683	.000483	....	....	
12,500	50,000	.003007	.000584	.001150	.001017	
12,750	51,000	.003433	.000366	....	....	
13,000	52,000	.003873	.000400	....	....	
13,250	53,000	.004333	.000500	....	....	
13,500	54,000	.005400	.000767	....	....	
13,750	55,000	.005500	.000400	.003333	.002183	
14,000	56,000	.006400	.000900	....	....	
14,250	57,000	.006750	.000350	....	....	
14,500	58,000	.007417	.000667	....	....	
14,750	59,000	.007967	.000550	....	....	
15,000	60,000	.008867	.000900	.006350	.003017	
15,500	62,000	.010033	.001166	....	....	
16,000	64,000	.011633	.001600	....	....	
16,500	66,000	.013333	.001700	....	....	
17,000	68,000	.015000	.001667	....	....	
17,500	70,000	.016683	.001683	....	....	
18,000	72,000	.018533	.001850	....	....	
18,500	74,000	.020717	.002184	....	....	
19,000	76,000	.022667	.001950	....	....	
19,500	78,000	.024967	.002300	....	....	
20,000	80,000	.027117	.002150	....	....	
20,500	82,000	.029750	.002633	....	....	
21,000	84,000	.032450	.002700	....	....	
21,500	86,000	.0367	.004250	....	....	
22,000	88,000	.0417	.0050	....	....	
22,500	90,000	.0450	.0033	....	....	
23,000	92,000	.0483	.0033	....	....	
23,500	94,000	.0550	.0067	....	....	
24,000	96,000	.0633	.0083	....	....	
24,500	98,000	.0750	.0117	....	....	
25,000	100,000	.0967	.0217	....	....	
25,070	100,280	.1200	.0233	....	....	Tensile strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8508
Hardness	20.47
Tensile strength per square inch of original section ....pounds..	100,280
Elastic limit per square inch of original section ....do....	45,000
Elongation per inch after rupture ....inch..	0.1483
Elongation per inch under strain at elastic limit ....do....	.001683
Reduction in diameter at point of rupture	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	1″.7 from neck
Character of broken surface	granular, with dull, spongy center
Elongation of inch sections	″.10, ″.12, ″.14, ″.14, ″.27*, ″.12

No. 808.

Marks, $^{10}\,\frac{\text{R. I}}{7}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	—.000033	—.000033	
2,500	10,000	.000183	.000100	—.000033	0.	
3,750	15,000	.000383	.000200	—.000033	0.	
5,000	20,000	.000550	.000167	—.000033	0.	
6,250	25,000	.000683	.000133	—.000033	0.	
7,500	30,000	.000850	.000167	—.000033	0.	
8,750	35,000	.001017	.000167	—.000033	0.	
10,000	40,000	.001217	.000200	—.000017	.000016	
10,250	41,000	.001233	.000016	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001317	.000050	....	....	
11,000	44,000	.001383	.000066	....	....	
11,250	45,000	.001417	.000034	.000033	.000050	Elastic limit.
11,500	46,000	.001533	.000116	....	....	
11,750	47,000	.001600	.000067	....	....	
12,000	48,000	.001733	.000133	....	....	
12,250	49,000	.001883	.000150	....	....	
12,500	50,000	.002083	.000200	.000433	.000400	
12,750	51,000	.002233	.000150	....	....	
13,000	52,000	.002400	.000167	....	....	
13,250	53,000	.002600	.000200	....	....	
13,500	54,000	.002983	.000383	....	....	
13,750	55,000	.003433	.000450	.001600	.001167	
14,000	56,000	.004200	.000767	....	....	
14,250	57,000	.004450	.000250	....	....	
14,500	58,000	.005167	.000717	....	....	
14,750	59,000	.005750	.000583	....	....	
15,000	60,000	.006567	.000817	.004367	.002767	
15,500	62,000	.007683	.001116	....	....	
16,000	64,000	.009333	.001650	....	....	
16,500	66,000	.010967	.001634	....	....	
17,000	68,000	.012700	.001733	....	....	
17,500	70,000	.014583	.001883	....	....	
18,000	72,000	.016383	.001800	....	....	
18,500	74,000	.018483	.002100	....	....	
19,000	76,000	.020533	.002050	....	....	
19,500	78,000	.022667	.002134	....	....	
20,000	80,000	.025033	.002366	....	....	
20,500	82,000	.027500	.002467	....	....	
21,000	84,000	.030200	.002700	....	....	
21,500	86,000	.033300	.003100	....	....	
22,000	88,000	.036667	.003367	....	....	
22,500	90,000	.040583	.003916	....	....	
23,000	92,000	.0433	.002717	....	....	
23,500	94,000	.0517	.0084	....	....	
24,000	96,000	.0600	.0083	....	....	
24,500	98,000	.0700	.0100	....	....	
25,000	100,000	.0917	.0217	....	....	
25,120	100,480	.1200	.0283	....	....	Tensile strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,480
Elastic limit per square inch of original section	do....	45,000
Elongation per inch after rupture	inch..	0.1467
Elongation per inch under strain at elastic limit	do....	.001417
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		1″.9 from neck
Character of broken surface		granular, dull spot at circumference
Elongation of inch sections		″.12, ″.30*, ″.15, ″.10, ″.09, ″.12

No. 809.

Marks, $^{10}\text{R. O}_{8}$
Diameter, ".564.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000283	.000133	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	.000017	.000017	
6,250	25,000	.000783	.000166	.000017	0.	
7,500	30,000	.000950	.000167	.000017	0.	
8,740	35,000	.001117	.000167	.000017	0.	
10,000	40,000	.001267	.000150	.000017	0.	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001367	.000050	....	....	
11,000	44,000	.001417	.000050	....	....	
11,250	45,000	.001483	.000066	.000050	.000033	
11,500	46,000	.001550	.000067	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	001650	.000067	....	....	
12,250	49,000	.001683	.000033	....	....	Elastic limit.
12,500	50,000	.001817	.000134	.000200	.000150	
12,750	51,000	.002017	.000200	....	....	
13,000	52,000	.002150	.000133	....	....	
13,250	53,000	002267	.000117	....	....	
13,500	54,000	.002467	.000200	....	....	
13,750	55,000	.002650	.000183	.000817	.000617	
14,000	56,000	.003000	.000350	....	....	
14,250	57,000	.003267	.000267	....	....	
14,500	58,000	.003600	.000333	....	....	
14,750	59,000	.004050	.000450	....	....	
15,000	60,000	.004567	.000517	.002433	.001616	
15,500	62,000	.005667	.001100	....	....	
16,000	64,000	.006967	.001300	....	....	
16,500	66,000	.008367	.001400	....	....	
17,000	68,000	.009883	.001516	....	....	
17,500	70,000	.011333	.001450	....	....	
18,000	72,000	.012833	.001500	....	....	
18,500	74,000	.014400	.001567	....	....	
19,000	76,000	.016033	.001633	....	....	
19,500	78,000	.017833	.001800	....	....	
20,000	80,000	.019833	.002000	....	....	
20,500	82,000	.021800	.001967	....	....	
21,000	84,000	.024000	.002200	....	....	
21,500	86,000	.026300	.002300	....	....	
22,000	88,000	.028683	.002383	....	....	
22,500	90,000	.031200	.002517	....	....	
23,000	92,000	.034417	.003217	....	....	
23,500	94,000	.037667	.003250	....	....	
24,000	96,000	.041183	.003516	....	....	
24,500	98,000	.045500	.004317	....	....	
25,000	100,000	.0517	.0062	....	....	
25,500	102,000	.0583	.0066	....	....	
26,000	104,000	.0683	.0100	....	....	
26,470	105,880	.1033	.0350	....	....	Tensile strength.
24,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	105,880
Elastic limit per square inch of original section	do.....	49,000
Elongation per inch after rupture	inch...	0.1217
Elongation per inch under strain at elastic limit	do.....	.001683
Reduction in diameter at point of rupture	do.....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		".8 from middle of stem
Character of broken surface		granular, dull center
Elongation of inch sections		".09, ".15, ".23*, ".10, ".09, ".07

No. 810.

Marks, $^{10\,\mathrm{R\,s\,M}}_{\quad 9}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	.000017	.000017	
2,500	10,000	.000300	.000150	.000017	0.	
3,750	15,000	.000483	.000183	.000033	.000016	
5,000	20,000	.000633	.000150	.000033	0.	
6,250	25,000	.000800	.000167	.000033	0.	
7,500	30,000	.000967	.000167	.000033	0.	
8,750	35,000	.001117	.000150	.000033	0.	
10,000	40,000	.001283	.000166	.000033	0.	
10,250	41,000	.001317	.000034	....	....	
10,500	42,000	.001350	.000033	....	....	
10,750	43,000	.001383	.000033	....	....	
11,000	44,000	.001417	.000034	....	....	
11,250	45,000	.001467	.000050	.000050	.000017	
11,500	46,000	.001533	.000066	....	....	
11,750	47,000	.001583	.000050	....	....	Elastic limit.
12,000	48,000	.001700	.000117	....	....	
12,250	49,000	.001800	.000100	....	....	
12,500	50,000	.002017	.000217	.000367	.000317	
12,750	51,000	.002167	.000150	....	....	
13,000	52,000	.002367	.000200	....	....	
13,250	53,000	.002600	.000233	....	....	
13,500	54,000	.002883	.000283	....	....	
13,750	55,000	.003233	.000350	.001350	.000983	
14,000	56,000	.003700	.000467	....	....	
14,250	57,000	.004033	.000333	....	....	
14,500	58,000	.004583	.000550	....	....	
14,750	59,000	.005133	.000550	....	....	
15,000	60,000	.005767	.000634	.003583	.002233	
15,500	62,000	.006967	.001200	....	....	
16,000	64,000	.008467	.001500	....	....	
16,500	66,000	.009967	.001500	....	....	
17,000	68,000	.011667	.001700	....	....	
17,500	70,000	.013333	.001666	....	....	
18,000	72,000	.015300	.001967	....	....	
18,500	74,000	.017167	.001867	....	....	
19,000	76,000	.019167	.002000	....	....	
19,500	78,000	.021200	.002033	....	....	
20,000	80,000	.023333	.002133	....	....	
20,500	82,000	.025667	.002334	....	....	
21,000	84,000	.028167	.002500	....	....	
21,500	86,000	.030833	.002666	....	....	
22,000	88,000	.034333	.003500	....	....	
22,500	90,000	.036867	.002534	....	....	
23,000	92,000	.041167	.004300	....	....	
23,500	94,000	.0467	.005533	....	....	
24,000	96,000	.0517	.0050	....	....	
24,500	98,000	.0583	.0066	....	....	
25,000	100,000	.0717	.0134	....	....	
25,390	101,560	.0967	.0250	....	....	Tensile strength.
24,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	101,560
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.1200
Elongation per inch under strain at elastic limit	do....	.001583
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1".7 from neck
Character of broken surface		granular; dull spot at circumference
Elongation of inch sections		".10, ".27*, ".18, ".10, ".08, ".05

No. 897.

Marks, $^{10\,B\,I}_{10}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000133	0.		
2,500	10,000	.000317	.000184	0.		
3,750	15,000	.000483	.000166	0.		
5,000	20,000	.000650	.000167	0.		
6,250	25,000	.000817	.000167	0.		
7,500	30,000	.000967	.000150	0.		
8,750	35,000	.001117	.000150	0.		
10,000	40,000	.001283	.000166	.000033	.000033	
11,250	45,000	.001433	.000150	.000050	.000017	
12,500	50,000	.001683	.000250	.000050	0.	
12,750	51,000	.001717	.000034			
13,000	52,000	.001750	.000033			
13,250	53,000	.001767	.000017			
13,500	54,000	.001817	.000050			
13,750	55,000	.001833	.000066	.000067	.000017	
14,000	56,000	.001867	.000034			
14,250	57,000	.001900	.000033			
14,500	58,000	.001933	.000033			
14,750	59,000	.001967	.000034			
15,000	60,000	.002033	.000066	.000067	0.	Elastic limit.
15,250	61,000	.002083	.000050			
15,500	62,000	.002200	.000117			
15,750	63,000	.002267	.000067			
16,000	64,000	.002400	.000133			
16,250	65,000	.002550	.000150	.000400	.000333	
16,500	66,000	.002817	.000267			
16,750	67,000	.003050	.000233			
17,000	68,000	.003333	.000283			
17,250	69,000	.003600	.000267			
17,500	70,000	.004350	.000750	.001883	.001483	
18,000	72,000	.005367	.001017			
18,500	74,000	.006783	.001416			
19,000	76,000	.008283	.001500			
19,500	78,000	.009967	.001684			
20,000	80,000	.011867	.001900			
20,500	82,000	.0133	.001433			
21,000	84,000	.0150	.0017			
21,500	86,000	.0167	.0017			
22,000	88,000	.0183	.0016			
22,500	90,000	.0200	.0017			
23,000	92,000	.0217	.0017			
23,500	94,000	.0233	.0016			
24,000	96,000	.0267	.0034			
24,500	98,000	.0300	.0033			
25,000	100,000	.0333	.0033			
25,500	102,000	.0350	.0017			
26,000	104,000	.0383	.0033			
26,500	106,000	.0433	.0050			
27,000	108,000	.0500	.0067			
27,500	110,000	.0567	.0067			
28,000	112,000	.0683	.0116			
28,500	114,000	.1000	.0317			Tensile strength.
24,800						Load at time of rupture.

General summary.

Specific gravity		7.8527
Hardness		22.02
Tensile strength per square inch of original section	pounds	114,000
Elastic limit per square inch of original section	do	61,000
Elongation per inch after rupture	inch	0.1250
Elongation per inch under strain at elastic limit	do	.002083
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.55 from neck
Character of broken surface		granular; dull, silky center
Elongation of inch sections		″.12, ″.28, ″.10, ″.08, ″.09, ″.08

No. 898.

Marks, $^{10}\frac{R\,8\,O}{11}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000467	.000167	0.	....	
5, 000	20, 000	.000633	.000166	0.	....	
6, 250	25 000	.000800	.000167	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 750	35, 000	.001133	.000166	0.	....	
10, 000	40, 000	.001283	.000150	0.	....	
11, 250	45, 000	.001417	.000134	0.	....	
12, 500	50, 000	.001617	.000200	0.	....	
12, 750	51, 000	.001617	0.	....	....	
13, 000	52, 000	.001633	.000016	....	....	
13, 250	53, 000	.001700	.000067	....	....	
13, 500	54, 000	.001750	.000050	....	....	
13, 750	55, 000	.001767	.000017	0.	....	
14, 000	56, 000	.001783	.000016	....	....	
14, 250	57, 000	.001817	.000034	....	....	
14, 500	58, 000	.001867	.000050	....	....	
14, 750	59, 000	.001900	.000033	....	....	
15, 000	60, 000	.001950	.000050	.000067	.000067	
15, 250	61, 000	.001983	.000033	....	....	
15, 500	62, 000	.002033	.000050	....	....	
15, 750	63, 000	.002083	.000050	....	....	
16, 000	64, 000	.002133	.000050	....	....	
16, 250	65, 000	.002200	.000067	.000117	.000050	Elastic limit.
16, 500	66, 000	.002383	.000183	....	....	
16, 750	67, 000	.002600	.000217	....	....	
17, 000	68, 000	.002967	.000367	....	....	
17, 250	69. 000	.003233	.000266	....	....	
17, 500	70, 000	.003800	.000567	.001367	.001250	
18, 000	72, 000	.004517	.000717	....	....	
18, 500	74, 000	.005533	.001016	....	....	
19, 000	76, 000	.006867	.001334	....	....	
19, 500	78, 000	.008333	.001466	....	....	
20, 000	80, 000	.010200	.001867	....	....	
20, 500	82, 000	.011417	.001217	....	....	
21, 000	84, 000	.012750	.001333	....	....	
21, 500	86. 000	.014533	.001783	....	....	
22, 000	88. 000	.016083	.001550	....	....	
22, 500	90, 000	.017750	.001667	....	....	
23, 000	92, 000	.019583	.001833	....	....	
23, 500	94, 000	.021667	.002084	....	....	
24, 000	96. 000	.023500	.001833	....	....	
24, 500	98. 000	.025667	.002167	....	....	
25, 000	100, 000	.028000	.002333	....	....	
25, 500	102, 000	.031500	.002500	....	....	
26, 000	104. 000	.033333	.002833	....	....	
26, 500	106. 000	.036000	.002667	....	....	
27, 000	108, 000	.040200	.004200	....	....	
27, 500	110, 000	.045300	.005100	....	....	
28, 000	112, 000	.0500	.0047	....	....	
28, 500	114, 000	.0550	.0050	....	....	
29, 000	116, 000	.0700	.0150	....	....	
29, 420	117, 680	.0967	.0267	....	....	Tensile strength.
16, 500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	117, 680
Elastic limit per square inch of original section	do....	65, 000
Elongation per inch after rupture	inch..	0. 1133
Elongation per inch under strain at elastic limit	do....	.002200
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		1".4 from neck
Character of broken surface		granular, dull silky center
Elongation of inch sections		".12. ".23, *".11, ".09, ".07, ".06

No. 899.

Marks, $10\frac{R_s M}{12}$

Diameter, ".564.

Sectional area, .25 square inch.

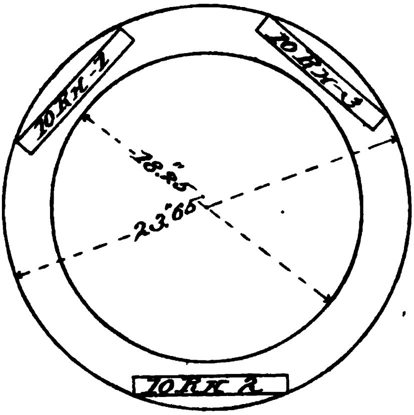
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000783	.000166	0.	....	
7,500	30,000	.000933	.000150	0.	....	
8,750	35,000	.001083	.000150	0.	....	
10,000	40,000	.001250	.000167	0.	....	
11,250	45,000	.001433	.000183	0.	....	
12,500	50,000	.001600	.000167	0.	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001717	.000050	....	....	
13,500	54,000	.001767	.000050	....	....	
13,750	55,000	.001800	.000033	.000067	.000067	Elastic limit.
14,000	56,000	.002033	.000233	....	....	
14,250	57,000	.002233	.000200	....	....	
14,500	58,000	.002467	.000234	....	....	
14,750	59,000	.002883	.000416	....	....	
15,000	60,000	.003533	.000650	.001450	.001383	
15,250	61,000	.003833	.000300	....	....	
15,500	62,000	.004183	.000350	....	....	
15,750	63,000	.004500	.000317	....	....	
16,000	64,000	.005083	.000583	....	....	
16,250	65,000	.005583	.000500	....	....	
16,500	66,000	.006250	.000667	....	....	
16,750	67,000	.007000	.000750	....	....	
17,000	68,000	.007750	.000750	....	....	
17,250	69,000	.008367	.000617	....	....	
17,500	70,000	.008967	.000600	....	....	
18,000	72,000	.010333	.001366	....	....	
18,500	74,000	.011917	.001584	....	....	
19,000	76,000	.013750	.001833	....	....	
19,500	78,000	.015600	.001850	....	....	
20,000	80,000	.017583	.001983	....	....	
20,500	82,000	.019250	.001667	....	....	
21,000	84,000	.021167	.001917	....	....	
21,500	86,000	.023167	.002000	....	....	
22,000	88,000	.025200	.002033	....	....	
22,500	90,000	.027583	.002383	....	....	
23,000	92,000	.030000	.002417	....	....	
23,500	94,000	.032917	.002917	....	....	
24,000	96,000	.036033	.003116	....	....	
24,500	98,000	.039500	.003467	....	....	
25,000	100,000	.043833	.004333	....	....	
25,500	102,000	.049667	.005834	....	....	
26,000	104,000	.0583	.008633	....	....	
26,500	106,000	.0683	.0100	....	....	
27,000	108,000	.0833	.0150	....	....	Tensile strength.

General summary.

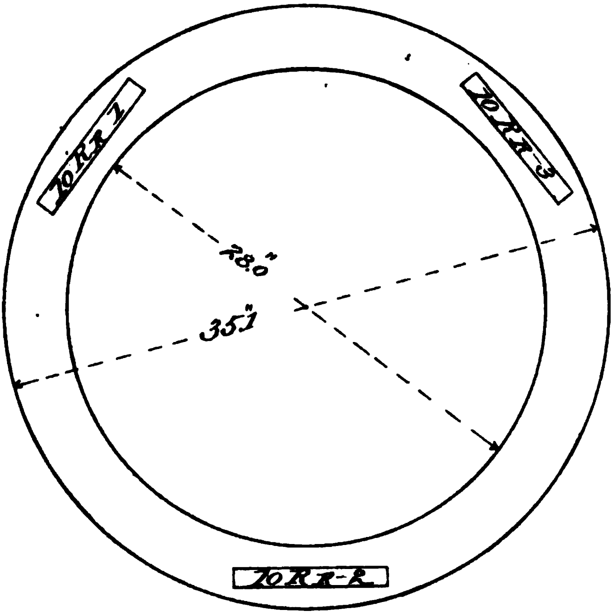
Tensile strength per square inch of original section	pounds..	108,000
Elastic limit, per square inch of original section	do ...	55,000
Elongation per inch after rupture	inch..	0.1117
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		".9 from neck
Character of broken surface		granular, dull silky center
Elongation of inch sections		".25, ".12, ".09, ".09, ".07, ".05

10" Steel wire-wound Rifle

Hammered Hoop RH

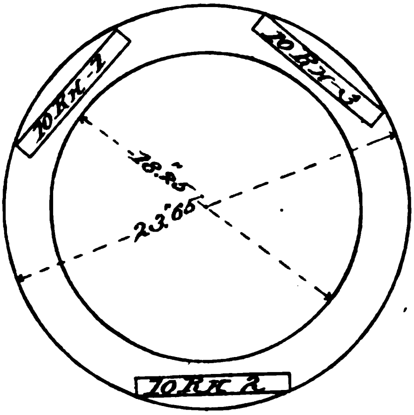


Rolled Hoop RR

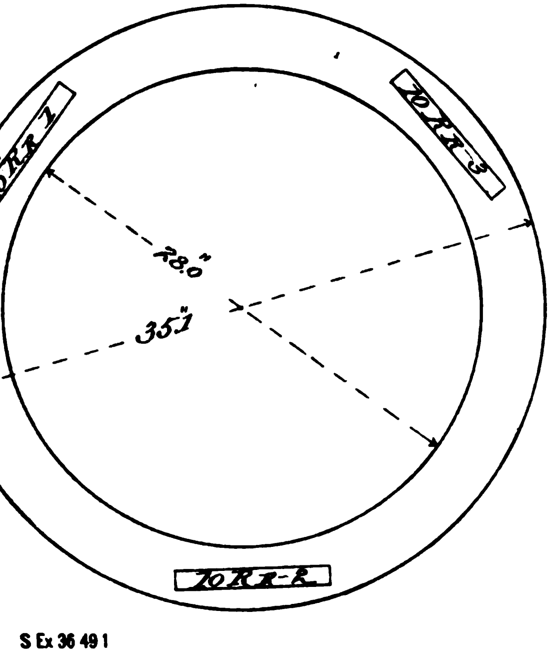


Steel wire-wound Rifle

Hammered Hoop RH



Rolled Hoop RR



S Ex 36 49 1

No. 417.

Tension Test.

Marks on bar, $^{10}\,{}^{\text{RH}}_{2}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000483	.000183	0.	....	
5, 000	20, 000	.000667	.000184	.000033	.000033	
6, 250	25, 000	.000800	.000133	.000033	0.	
7, 500	30, 000	.000950	.000150	.000033	0.	
8, 750	35, 000	.001117	.000167	.000033	0.	
10, 000	40, 000	.001267	.000150	.000033	0.	
10, 250	41, 000	.001283	.000016	....	....	
10, 500	42, 000	.001333	.000050	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001433	.000033	.000050	.000017	
11, 500	46, 000	.001467	.000034	....	....	
11, 750	47, 000	.001500	.000033	....	....	
12, 000	48, 000	.001533	.000033	....	....	
12, 250	49, 000	.001567	.000034	....	....	
12, 500	50, 000	.001617	.000050	.000050	0.	
12, 750	51, 000	.001650	.000033	....	....	
13, 000	52, 000	.001700	.000050	....	....	
13, 250	53, 000	.001733	.000033	....	....	Elastic limit.
13, 500	54, 000	.001817	.000084	....	....	
13, 750	55, 000	.001933	.000116	.000167	.000117	
14, 000	56, 000	.002667	.000734	....	....	
14, 250	57, 000	.003083	.000416	....	....	
14, 500	58, 000	.003667	.000584	....	....	
14, 750	59, 000	.004333	.000666	....	....	
15, 000	60, 000	.005200	.000867	.003150	.002983	
15, 250	61, 000	.005867	.000667	....	....	
15, 500	62, 000	.006800	.000933	....	....	
15, 750	63, 000	.007333	.000533	....	....	
16, 000	64, 000	.008117	.000784	....	....	
16, 250	65, 000	.008967	.000850	.006450	.003300	
16, 500	66, 000	.009783	.000816	....	....	
16, 750	67, 000	.010250	.000467	....	....	
17, 000	68, 000	.011500	.001250	....	....	
17, 250	69, 000	.012200	.000700	....	....	
17, 500	70, 000	.013333	.001133	.010650	.004200	
18, 000	72, 000	.014850	.001517	....	....	
18, 500	74, 000	.016500	.001650	....	....	
19, 000	76, 000	.018467	.001967	....	....	
19, 500	78, 000	.020967	.002500	....	....	
20, 000	80, 000	.022833	.001866	....	....	
20, 500	82, 000	.025167	.002334	....	....	
21, 000	84, 000	.027750	.002583	....	....	
21, 500	86, 000	.030500	.002750	....	....	
22, 000	88, 000	.033333	.002833	....	....	
22, 500	90, 000	.037000	.003667	....	....	
23, 000	92, 000	.041667	.004667	....	....	Micrometer removed.
23, 500	94, 000	.0483	.006633	....	....	
24, 000	96, 000	.0533	.0050	....	....	
24, 500	98, 000	.0617	.0084	....	....	
25, 000	100, 000	.0750	.0133	....	....	
25, 460	101, 840	.1133	.0388	....	....	Ultimate strength.
23, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 101, 840
Elastic limit per square inch of original section .... do.... 53, 000
Elongation per inch after rupture .... inch.. 0. 1467
Elongation per inch under strain at elastic limit .... do.... .001733
Reduction in diameter at point of rupture .... do.... .114
Reduction in area after rupture per centum of original section 36. 4
Position of rupture .... 1″.10 from middle of stem
Character of broken surface .... fine, granular, 60 per cent.; dull, smoky center, 40 per cent.
Elongation of inch sections .... ″.10, ″.11, ″.12, ″.20 (″.25 fractured section), ″.10

No. 418.

Tension Test.

Marks on bar, $^{10}\mathrm{R}_{s}$ $_{3}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	.000017	.000017	
6,250	25,000	.000800	.000167	.000017	0.	
7,500	30,000	.000967	.000167	.000033	.000016	
8,750	35,000	.001117	.000150	.000033	0.	
10,000	40,000	.001283	.000166	.000050	.000017	
10,250	41,000	.001300	.000017	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
12,000	44,000	.001417	.000050	....	....	
11,250	45,000	.001467	.000050	.000050	0.	
11,500	46,000	.001483	.000016	....	....	
11,750	47,000	.001517	.000034	....	....	
12,000	48,000	.001550	.000033	....	....	
12,250	49,000	.001583	.000033	....	....	
12,500	50,000	.001633	.000050	.000050	.0	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001717	.000050	....	....	
13,250	53,000	.001750	.000033	....	....	
13,500	54,000	.001800	.000050	....	....	
13,750	55,000	.001833	.000033	.000067	.000017	
14,000	56,000	.001867	.000034	....	....	Elastic limit.
14,250	57,000	.001967	.000100	....	....	
14,500	58,000	.002783	.000816	....	....	
14,750	59,000	.003583	.000800	....	....	
15,000	60,000	.004467	.000884	.002383	.002316	
15,250	61,000	.004867	.000400	....	....	
15,500	62,000	.005667	.000800	....	....	
15,750	63,000	.006200	.000533	....	....	
16,000	64,000	.007167	.000967	....	....	
16,250	65,000	.007833	.000666	.005417	.003034	
16,500	66,000	.008667	.000834	....	....	
16,750	67,000	.009333	.000666	....	....	
17,000	68,000	.010167	.000834	....	....	
17,250	69,000	.011000	.000833	....	....	
17,500	70,000	.011967	.000967	.009167	.003750	
18,000	72,000	.013500	.001533	....	....	
18,500	74,000	.015333	.001833	....	....	
19,000	76,000	.017500	.002167	....	....	
19,500	78,000	.019367	.001867	....	....	
20,000	80,000	.021333	.001966	....	....	
20,500	82,000	.023833	.002500	....	....	
21,000	84,000	.026167	.002334	....	....	
21,500	86,000	.028867	.002700	....	....	
22,000	88,000	.032167	.003300	....	....	
22,500	90,000	.034667	.002500	....	....	
23,000	92,000	.038333	.003666	....	....	
23,500	94,000	.042833	.004500	....	....	
24,000	96,000	.048667	.005834	....	....	Micrometer removed.
24,500	98,000	.0583	.009633	....	....	
25,000	100,000	.0667	.0084	....	....	
25,500	102,000	.0867	.0200	....	....	
25,800	103,200	.1183	.0316	....	....	Ultimate strength.
23,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................................pounds.. 103,200
Elastic limit per square inch of original section ....do.... 56,000
Elongation per inch after rupture ....inch.. 0.1550
Elongation per inch under strain at elastic limit...do .... .001867
Reduction in diameter at point of rupture...do.... .124
Reduction in area after rupture, per centum of original section 39.2
Position of rupture ....1″ from neck
Character of broken surface ....fine granular, 60 per cent.; dull, smoky center, 40 per cent.
Elongation of inch sections ....″.10, ″.11, ″.16, ″.14, ″.18 (″.24 fractured section)

No. 419.

Tension Test.

Marks on bar, $^{10\,R_s}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	.000017	.000017	
6,250	25,000	.000783	.000166	.000017	0.	
7,500	30,000	.000950	.000167	.000017	0.	
8,750	35,000	.001117	.000167	.000017	0.	
10,000	40,000	.001283	.000166	.000017	0.	
10,250	41,000	.001283	0.	....	....	
10,500	42,000	.001333	.000050	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001417	.000050	....	....	
11,250	45,000	.001450	.000033	.000033	.000016	
11,500	46,000	.001517	.000067	....	....	
11,750	47,000	.001550	.000033	....	....	
12,000	48,000	.001583	.000033	....	....	
12,250	49,000	.001617	.000034	....	....	Elastic limit.
12,500	50,000	.001733	.000116	.000183	.000150	
12,750	51,000	.002633	.000900	....	....	
13,000	52,000	.003150	.000517	....	....	
13,250	53,000	.003583	.000433	....	....	
13,500	54,000	.004250	.000667	....	....	
13,750	55,000	.004833	.000583	.002917	.002734	
14,000	56,000	.005817	.000984	....	....	
14,250	57,000	.006183	.000366	....	....	
14,500	58,000	.007167	.000984	....	....	
14,750	59,000	.007800	.000633	....	....	
15,000	60,000	.008700	.000900	.006417	.003500	
15,250	61,000	.009333	.000633	....	....	
15,500	62,000	.010333	.001000	....	....	
15,750	63,000	.011000	.000667	....	....	
16,000	64,000	.011917	.000917	....	....	
16,250	65,000	.012833	.000916	.010217	.003800	
16,500	66,000	.013833	.001000	....	....	
16,750	67,000	.014500	.000667	....	....	
17,000	68,000	.015583	.001083	....	....	
17,250	69,000	.016333	.000750	....	....	
17,500	70,000	.018000	.001667	.015083	.004866	
18,000	72,000	.019550	.001550	....	....	
18,500	74,000	.022200	.002650	....	....	
19,000	76,000	.024417	.002217	....	....	
19,500	78,000	.026667	.002250	....	....	
20,000	80,000	.029500	.002833	....	....	
20,500	82,000	.032417	.002917	....	....	
21,000	84,000	.036133	.003716	....	....	
21,500	86,000	.040167	.004034	....	....	
22,000	88,000	.044333	.004166	....	....	
22,500	90,000	.050000	.005667	....	....	Micrometer removed.
23,000	92,000	.0600	.0100	....	....	
23,500	94,000	.0683	.0083	....	....	
24,000	96,000	.0850	.0167	....	....	
24,325	97,300	.1217	.0367	....	....	Ultimate strength.
22,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8568
Hardness		20.03
Tensile strength, per square inch of original section	pounds..	97,300
Elastic limit, per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001617
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.50 from middle of stem
Character of broken surface		fine granular, 50 per cent.; dull, smoky center, 50 per cent.
Elongation of inch sections		″.09, ″.11, ″.14 (″.34 fractured section), ″.14, ″.10

No. 420.

Tension Test.

Marks on bar, $^{10}{}_{2}{}^{\mathrm{R_s}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000567	.000150	0.	....	
6,250	25,000	.000717	.000150	0.	....	
7,500	30,000	.000867	.000150	0.	....	
8,750	35,000	.001050	.000183	0.	....	
10,000	40,000	.001217	.000167	0.	....	
10,250	41,000	.001250	.000033	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001317	.000017	....	....	
11,000	44,000	.001367	.000050	....	....	
11,250	45,000	.001400	.000033	.000017	.000017	
11,500	46,000	.001483	.000083	....	....	
11,750	47,000	.001533	.000050	....	....	Elastic limit.
12,000	48,000	.002750	.002217	....	....	
12,250	49,000	.003500	.000750	....	....	
12,500	50,000	.004183	.000683	.002417	.002400	
12,750	51,000	.004533	.000350	....	....	
13,000	52,000	.005333	.000800	....	....	
13,250	53,000	.006000	.000667	....	....	
13,500	54,000	.006667	.000667	....	....	
13,750	55,000	.007217	.000550	.005200	.002783	
14,000	56,000	.008200	.000983	....	....	
14,250	57,000	.008583	.000383	....	....	
14,500	58,000	.009467	.000884	....	....	
14,750	59,000	.010250	.000783	....	....	
15,000	60,000	.011167	.000917	.008750	.003550	
15,250	61,000	.011683	.000516	....	....	
15,500	62,000	.012667	.000984	....	....	
15,750	63,000	.013333	.000666	....	....	
16,000	64,000	.014417	.001084	....	....	
16,250	65,000	.015300	.000883	.012633	.003883	
16,500	66,000	.016300	.001000	....	....	
16,750	67,000	.017167	.000867	....	....	
17,000	68,000	.018333	.001166	....	....	
17,250	69,000	.019200	.000867	....	....	
17,500	70,000	.020500	.001300	.017517	.004884	
18,000	72,000	.022800	.002300	....	....	
18,500	74,000	.025000	.002200	....	....	
19,000	76,000	.027833	.002833	....	....	
19,500	78,000	.030250	.002417	....	....	
20,000	80,000	.033333	.003083	....	....	
20,500	82,000	.036667	.003334	....	....	
21,000	84,000	.040667	.004000	....	....	
21,500	86,000	.047833	.006666	....	....	
22,000	88,000	.051167	.003834	....	....	
22,500	90,000	.058333	.007166	....	....	Micrometer removed.
23,000	92,000	.0633	.004967	....	....	
23,500	94,000	.0833	.0200	....	....	
23,960	95,840	.1167	.0334	....	....	Ultimate strength.
21,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds..	95,840
Elastic limit per square inch of original section............do....	47,000
Elongation per inch after rupture............inch..	0.1633
Elongation per inch under strain at elastic limit............do....	.001533
Reduction in diameter at point of rupture ....do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture............	″.80 from middle of stem
Character of broken surface	dull, smoky, interspersed with fine granular metal
Elongation of inch sections	″.10, ″.12, ″.14 (″.33 fractured section), ″.18, ″.11

No. 421.

Tension Test.

Marks on bar, $^{10\ \mathrm{R_s}}_{8}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000567	.000150	0.	....	
6,250	25,000	.000717	.000150	0.	....	
7,500	30,000	.000900	.000183	c.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	,001233	.000166	.000017	.000017	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001317	.000050	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001383	.000033	....	....	
11,250	45,000	.001417	.000034	.000033	.000016	
11,500	46,000	.001483	.000066	....	....	
11,750	47,000	.001517	.000034	....	....	
12,000	48,000	.001600	.000083	....	....	Elastic limit.
12,250	49,000	.002967	.001367	....	....	
12,500	50,000	.003750	.000783	.001967	.001934	
12,750	51,000	.004133	.000383	....	....	
13,000	52,000	.004667	.000534	....	....	
13,250	53,000	.005100	.000433	....	....	
13,500	54,000	.005850	.000750	....	....	
13,750	55,000	.006583	.000733	.004533	.002566	
14,000	56,000	.007300	.000717	....	....	
14,250	57,000	.007917	.000617	....	....	
14,500	58,000	.008667	.000750	....	....	
14,750	59,000	.009333	.000666	....	....	
15,000	60,000	.010333	.001000	.008033	.003500	
15,250	61,000	.011000	.000667	....	....	
15,500	62,000	.012000	.001000	....	....	
15,750	63,000	.012667	.000667	....	....	
16,000	64,000	.013667	.001000	....	....	
16,250	65,000	.014333	.000666	.011683	.003650	
16,500	66,000	.015333	.001000	....	....	
16,750	67,000	.016083	.000750	....	....	
17,000	68,000	.017333	.001250	....	....	
17,250	69,000	.018333	.001000	....	....	
17,500	70,000	.019417	.001084	.016500	....	
18,000	72,000	.021033	.001616	....	....	
18,500	74 000	.023833	.002800	....	....	
19,000	76,000	.026167	.002334	....	....	
19,500	78,000	.028500	.002333	....	....	
20,000	80,000	.030300	.001800	....	....	
20,500	82,000	.033000	.004700	....	....	
21,000	84,000	.038667	.003667	....	....	
21,500	86,000	.042833	.004166	....	....	
22,000	88,000	.047333	.004500	....	....	
22,500	90,000	.053333	.006000	....	....	Micrometer removed.
23,000	92,000	.0633	.009967	....	....	
23,500	94,000	.0750	.0117	....	....	
24,000	96,000	.0967	.0217	....	....	
24,260	97,040	.1317	.0350	....	....	Ultimate strength.
22,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	97,040
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.1733
Elongation per inch under strain at elastic limit	do....	.001600
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.45 from middle of stem
Character of broken surface		fine granular. 40 per cent.; dull smoky center, 60 per cent.
Elongation of inch sections		″.09, ″.13, ″.17 (″.34 fractured section), ″.18, ″.12

TABULATION OF TENSION SPECIMENS FROM 10″ STEEL WIRE-WOUND RIFLE.

No. of test.	Position in gun.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.	Remarks.
			Pounds.	*Pounds.*	*Per c't.*	*Per cent.*				
717	Steel tube		40,000	87,500	23.5	40.5	Granular and dull smoky	7.8708		
718			40,000	87,400	18.0	34.0	do	7.8700		
830	Breech end of steel tube.	Outside 1	36,000	77,280	29.0	47.2	Silky			
830½		Middle 2	35,000	79,840	29.5	39.2	Silky and fine granular			
831		Radial 3	35,000	79,640	27.5	41.9	do	7.8630	13.08	
832		Radial 4	36,000	79,280	27.0	41.9	do			
837		Tangential 5	23,000	76,080	21,7	39.2	Dull silky and fine granular			Previously shortened 1 per cent. of length by compression.
838		Tangential 6	3[illegible],000	77,600	16.7	47.2	Silky			
833	Muzzle end of steel tube.	Outside 1	34,000	71,840	27.0	41.9	Silky and fine granular			
834		Middle 2	33,000	68,640	29.5	52.2	Fine silky			
835		Radial 3	31,000	68,720	28.5	47.2	do	7.8630	10.69	
836		Radial 4	33,000	68,800	24.5	44.6	Dull silky and granular			
839		Tangential 5	20,000	66,440	24.8	52.2	Fine silky			Previously shortened 1 per cent. of length by compression.
840		Tangential 6	21,000	68,160	21.7	47.2	Silky			
926	Steel sleeve	Middle 1	55,000	104,120	18.7	24.6	Granular, dull spot	7.8411	15.83	
927		Middle 2	57,000	102,000	15.8	27.6	Silky			
928		Middle 3	56,000	101,720	15.7	33.5	Silky traces of granulation			
636	Steel trunnion ring section.	Inside 1	41,000	92,800	12.7	47.2	Silky			
635		Middle 2	48,000	91,280	16.5	49.7	do			
634		Inside 3	38,000	96,200	16.5	49.7	do			
490	Steel hoop 8	Middle 1	49,000	99,880	14.5	30.6	Fine granular, dull center	7.8557	20.25	Rolled hoop.
491		Middle 2	45,000	95,200	15.2	41.9	Dull spongy			
492		Middle 3	48,000	100,000	15.0	36.4	Dull spongy and granular			
658		Middle 4	45,000	100,280	14.8	30.6	do	7.8508	20.47	
808		Inside 7	45,000	100,480	14.7	30.6	Granular, dull spot			
809		Outside 8	49,000	105,880	12,2	27.6	Granular, dull center			
810		Middle 9	47,000	101,560	12.0	27.6	Granular, dull spot			
897		Inside 10	61,000	114,000	12.5	36.4	Granular, dull silky center	7.8527	22.02	Taken out after retreatment of hoop.
898		Outside 11	65,000	117,680	11.8	30.6	do			
899		Middle 12	55,000	108,000	11.2	33.5	do			
416	Steel hoop RH	Middle 1	56,000	101,120	16.5	41.9	Fine granular and dull smoky	7.8571	22.52	Hammered hoop.
417		Middle 2	53,000	101,840	14.7	36.4	do			
418		Middle 3	56,000	103,200	15.5	39.2	do			
419	Steel hoop RR	Middle 1	49,000	97,800	15.8	39.2	do	7.8568	20.03	Rolled hoop.
420		Middle 2	47,000	95,840	16.3	36.4	do			
421		Middle 3	48,000	97,040	17.3	39.2	do			

TABULATION OF COMPRESSION SPECIMENS FROM 10″ STEEL WIRE-WOUND RIFLE.

No. of test.	Position in gun.	Location of specimen.	Length.	Diameter.	Sectional area.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*		
523	Steel tube	Radial 7	4.5	.798	.50	34,000	77,240	Triple flexure	Breech end.
524		Radial 8	4.5	.798	.50	35,000	77,440	do	
519		Tangential 5	10.15	1.005	.793	37,000		Shortened 1 per cent. by load of 42,000 pounds per square inch.	Afterwards tested by tension.
520		Tangentisl 6	10.15	1.017	.812	33,000		Shortened 1 per cent. by load of 44,000 pounds per square inch.	
525	Steel tube	Radial 7	4.5	.798	.50	30,000	68,280	Triple flexure.	Muzzle end.
526		Radial 8	4.5	.798	.50	30,000	68,960	do	
521		Tangential 5	10.03	1.002	.787	32,000		Shortened 1 per cent. by load of 35,960 pounds per square inch.	Afterwards tested by tension.
522		Tangential 6	10.03	1.002	.787	33,000		Shortened 1 per cent. by load of 37,990 pounds per square inch.	
504	Section of steel trunnion ring.	Outside 4	5.00	.798	.50	44,000	83,160	Triple flexure	Specific gravity, 7.8682. Hardness, 16.28.

5.—10″ CAST-IRON WIRE-WOUND RIFLE.

[Cast-iron specimens from breech and muzzle rings of body, and steel specimens from sleeve.]

BREECH-RING OF CAST-IRON BODY FOR 10″ CAST-IRON WIRE-WOUND RIFLE.

Nos. 8 and 11 were tested by compression, and afterwards cut in two and tested by tension.

The tension specimens are marked with the same numbers as the compression specimen from which they were taken, with the letters a and b affixed.

No. 364.

Compression Tests.

Marks on bar, 8.
Diameter, 1″.129.
Sectional area, 1″ square inch.
Length, 12″.
Ultimate strength, 55,690 pounds per square inch.
Failed by triple flexure. Fractures started on tension side. Middle deflection reached ″.43.

No. 366.

Marks on bar, 11.
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 11″.66.
Ultimate strength, 60,710 pounds per square inch.
Failed by triple flexure. Fracture developed on the tension side when the middle deflection reached ″.38.

No. 811.

Tension Tests.

Marks, 8 a
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	0.	....	....	....	
750	3,000	.000100	.000100	....	....	
1,000	4,000	.000150	.000050	....	....	
1,250	5,000	.000200	.000050	0.	....	
1,500	6,000	.000250	.000050	....	....	
1,750	7,000	.000250	0.	....	....	
2,000	8,000	.000400	.000150	....	....	
2,250	9,000	.000450	.000050	....	....	
2,500	10,000	.000500	.000050	0.	....	
2,750	11,000	.000550	.000050	....	....	
3,000	12,000	.000650	.000100	....	....	
3,250	13,000	.000700	.000050	....	....	
3,500	14,000	.000900	.000200	....	....	
3,750	15,000	.001050	.000150	.000350	.000350	
4,000	16,000	.001200	.000150	....	....	
4,250	17,000	.001450	.000250	....	....	
4,500	18,000	.001700	.000250	....	....	
4,750	19,000	.001950	.000250	....	....	
5,000	20,000	.002150	.000200	.001150	.000800	
5,250	21,000	.002500	.000350	....	....	
5,500	22,000	.002950	.000450	....	....	
5,750	23,000	.003250	.000300	....	....	
6,000	24,000	.003650	.000400	....	....	
6,250	25,000	.004000	.000350	.002500	.001350	
7,735	30,940	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................pounds.. 30,940
Position of rupture....................".3 from middle of stem
Character of broken surface....................granular

No. 812.

Marks, 8 b
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000100	.000100	....	....	
750	3,000	.000150	.000050	....	....	
1,000	4,000	.000250	.000100	....	....	
1,250	5,000	.000300	.000050	.000050	.000050	
1,500	6,000	.000350	.000050	....	....	
1,750	7,000	.000400	.000050	....	....	
2,000	8,000	.000450	.000050	....	....	
2,250	9,000	.000500	.000050	....	....	
2,500	10,000	.000550	.000050	000050	0.	
2,750	11,000	.000600	.000050	....	....	
3,000	12,000	.000650	.000050	....	....	
3,250	13,000	.000750	.000100	....	....	
3,500	14,000	.000850	.000100	....	....	
3,750	15,000	.000950	.000100	000300	.000250	
4,000	16,000	.001050	.000100	....	....	
4,250	17,000	.001250	.000200	....	....	
4,500	18,000	.001450	.000200	....	....	
4,750	19,000	.001600	.000150	....	....	
5,000	20,000	.002000	.000400	.000950	.000650	
5,250	21,000	.002150	.000150	....	....	
5,500	22,000	.002500	.000350	....	....	
5,750	23,000	.002750	.000250	....	....	
6,000	24,000	.003250	.000500	....	....	
6,250	25,000	.003600	.000350	.002150	.001800	
8,365	33,460	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....................................pounds.. 33,460
Position of rupture ....at middle of stem
Character of broken surface...granular

No. 813.

Marks, 11 a
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000050	.000050	....	....	
750	3,000	.000150	.000100	....	....	
1,000	4,000	.000200	.000050	....	....	
1,250	5,000	.000250	.000050	0.	....	
1,500	6,000	.000300	.000050	....	....	
1,750	7,000	.000350	.000050	....	....	
2,000	8,000	.000400	.000050	....	....	
2,250	9,000	.000450	.000050	....	....	
2,500	10,000	.000550	.000100	.000050	.000050	
2,750	11,000	.000650	.000100	....	....	
3,000	12,000	.000850	.000200	....	....	
3,250	13,000	.001000	.000150	....	....	
3,500	14,000	.001200	.000200	....	....	
3,750	15,000	.001550	.000350	.000700	.000650	
4,000	16,000	.001900	.000350	....	....	
4,250	17,000	.002200	.000300	....	....	
4,500	18,000	.002700	.000500	....	....	
4,750	19,000	.003100	.000400	....	....	
5,000	20,000	.003850	.000750	.002550	.001850	
5,240	20,960	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	20,960
Position of rupture	''.2 from neck
Character of broken surface..	granular

No. 814.

Marks, 11 b
Diameter, ".564.
Sectional area, .25 square inch.

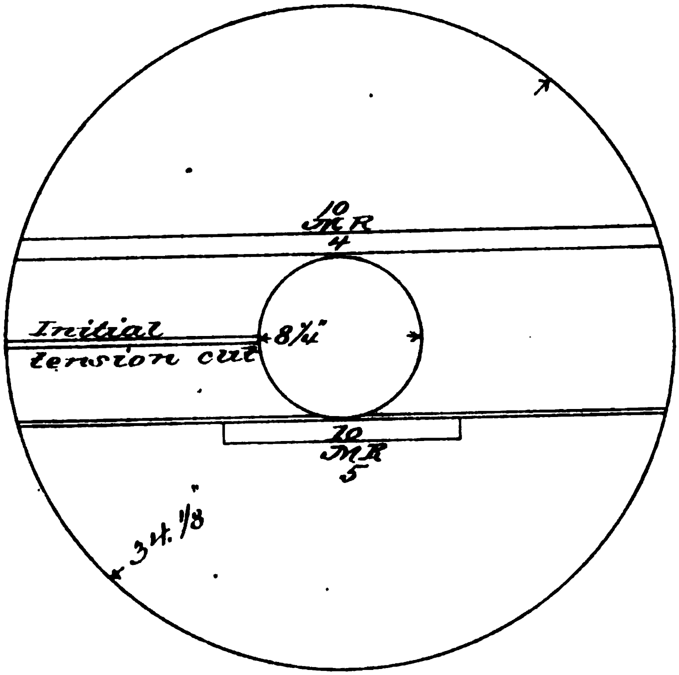
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000050	.000050	....	....	
750	3,000	.000100	.000050	....	....	
1,000	4,000	.000150	.000050	....	....	
1,250	5,000	.000200	.000050	.000000	.000000	
1,500	6,000	.000250	.000050	....	....	
1,750	7,000	.000300	.000050	....	....	
2,000	8,000	.000400	.000100	....	....	
2,250	9,000	.000450	.000050	....	....	
2,500	10,000	.000550	.000100	.000050	.000050	
2,750	11,000	.000600	.000050	....	....	
3,000	12,000	.000750	.000150	....	....	
3,250	13,000	.000850	.000100	....	....	
3,500	14,000	.001050	.000200	....	....	
3,750	15,000	.001250	.000200	.000350	.000300	
4,000	16,000	.001500	.000250	....	....	
4,250	17,000	.001600	.000100	....	....	
4,500	18,000	.001800	.000200	....	....	
4,750	19,000	.002050	.000250	....	....	
5,000	20,000	.002300	.000250	.001100	.000750	
5,250	21,000	.002600	.000300	....	....	
5,500	22,000	.002950	.000350	....	....	
5,750	23,000	.003200	.000250	....	....	
6,000	24,000	.003750	.000550	.002300	.001200	
7,380	29,520	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 29,520
Position of rupture.. ".4 from neck
Character of broken surface .... granular

10" Cast Iron wire-wound Rifle

Muzzle Ring



No. 424.

Tension Test.

Marks on bar, $\overset{10}{\underset{4}{\mathrm{M\ R}}}$

Diameter, 1''.129.

Sectional area, 1 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000010	.000010	0.	....	
2,000	2,000	.000050	.000040	0.	....	
3,000	3,000	.000110	.000060	0.	....	
4,000	4,000	.000165	.000055	0.	....	
5,000	5,000	.000210	.000045	0.	....	
6,000	6,000	.000265	.000055	.000005	.000005	
7,000	7,000	.000325	.000060	.000010	.000005	
8,000	8,000	.000385	.000060	.000015	.000005	
9,000	9,000	.000445	.000060	.000025	.000010	
10,000	10,000	.000500	.000055	.000030	.000005	
11,000	11,000	.000560	.000060	.000040	.000015	
12,000	12,000	.000640	.000080	.000055	.000015	
13,000	13,000	.000690	.000050	.000065	.000010	
14,000	14,000	.000760	.000070	.000080	.000010	
15,000	15,000	.000850	.000090	.000095	.000015	
16,000	16,000	.000935	.000085	.000115	.000020	
17,000	17,000	.001005	.000070	.000145	.000030	
18,000	18,000	.001100	.000095	.000155	000010	
19,000	19,000	.001200	.000100	.000193	.000040	
20,000	20,000	.001305	.000105	.000235	.000040	
21,000	21,000	.001410	.000105	.000265	.000030	
22,000	22,000	.001550	.000140	.000340	.000075	
23,000	23,000	.001690	.000140	.000395	.000055	
24,000	24,000	.001845	.000155	.000485	.000090	
25,000	25,000	.002025	.000180	.000585	.000100	
26,000	26,000	.002250	.000225	.000710	.000125	
26,990	26,990	....	....	....	....	Ultimate strength.

General summary.

Specific gravity	7.2663
Hardness	17.26
Tensile strength per square inch of original section	pounds.. 26,990
Elastic limit per square inch of original section	not well defined
Position of rupture	6''.70 from neck
Character of broken surface	coarse granular, mottled

No. 414.

Compression Test.

Marks on bar, $\overset{10}{\underset{5}{\text{M R}}}$
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

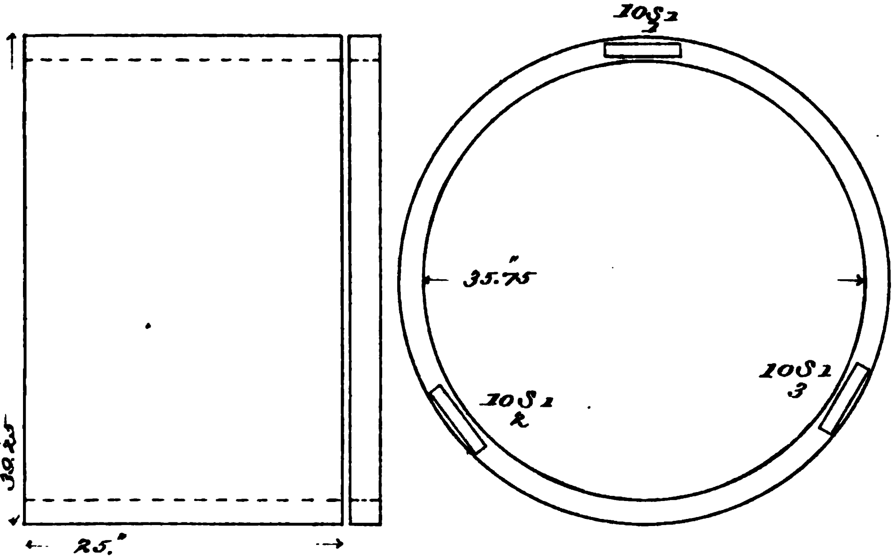
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.		
3,000	3,000	.000120	.000050	.000010	.000010	
4,000	4,000	.000170	.000050	.000010	0.	
5,000	5,000	.000220	.000050	.000020	.000010	
6,000	6,000	.000270	.000050	.000030	.000010	
7,000	7,000	.000320	.000050	.000040	.000010	
8,000	8,000	.000380	.000060	.000050	.000010	
9,000	9,000	.000430	.000050	.000050	0.	
10,000	10,000	.000490	.000060	.000060	.000010	
11,000	11,000	.000550	.000060	.000060	0.	
12,000	12,000	.000620	.000070	.000070	.000010	
13,000	13,000	.000670	.000050	.000070	0.	
14,000	14,000	.000720	.000050	.000080	.000010	
15,000	15,000	.000770	.000050	.000080	0.	
16,000	16,000	.000840	.000070	.000090	.000010	
17,000	17,000	.000900	.000060	.000090	0.	
18,000	18,000	.000970	.000070	.000100	.000010	
19,000	19,000	.001020	.000050	.000100	0.	
20,000	20,000	.001090	.000070	.000110	.000010	
21,000	21,000	.001170	.000080	.000110	0.	
22,000	22,000	.001220	.000050	.000130	.000020	
23,000	23,000	.001280	.000060	.000150	.000020	
24,000	24,000	.001370	.000090	.000160	.000010	
25,000	25,000	.001450	.000080	.000170	.000010	
26,000	26,000	.001510	.000060	.000190	.000020	
27,000	27,000	.001580	.000070	.000220	.000030	
28,000	28,000	.001670	.000090	.000260	.000040	
29,000	29,000	.001760	.000090	.000280	.000020	
30,000	30,000	.001850	.000090	.000310	.000030	
31,000	31,000	.001940	.000090	.000360	.000050	
32,000	32,000	.002060	.000120	.000400	.000040	
33,000	33,000	.002170	.000110	.000470	.000070	
34,000	34,000	.002280	.000110	.000520	.000050	
35,000	35,000	.002410	.000130	.000610	.000090	
36,000	36,000	.002560	.000150	.000690	.000080	
37,000	37,000	.002730	.000170	.000820	.000130	Perceptible deflection.
38,000	38,000	.002910	.000180	.000920	.000100	
39,000	39,000	.003070	.000160	.001070	.000150	
40,000	40,000	.003320	.000250	.001230	.000160	
55,150	....	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section..................................pounds.. 55,150
Manner of failure ....triple flexure

10" Cast Iron wire-wound Rifle

Sleeve casting (steel)



No. 413.

Tension Test.

Marks on bar, $10\,^{Si}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000300	.000200	0.		
3,750	15,000	.000433	.000133	0.		
5,000	20,000	.000633	.000200	0.		
6,250	25,000	.000767	.000134	0.		
7,500	30,000	.000967	.000200	.000033		
8,750	35,000	.001067	.000100	.000033		
10,000	40,000	.001267	.000200	.000033		
10,250	41,000	.001300	.000033			
10,500	42,000	.001333	.000033			
10,750	43,000	.001333	0.			
11,000	44,000	.001367	.000034			
11,250	45,000	.001400	.000033	.000033	0.	
11,500	46,000	.001433	.000033			
11,750	47,000	.001467	.000034			
12,000	48,000	.001500	.000033			
12,250	49,000	.001500	0.			
12,500	50,000	.001633	.000133	.000100	.000067	
12,750	51,000	.001667	.000034			
13,000	52,000	.001733	.000066			
13,250	53,000	.001767	.000034			Elastic limit.
13,500	54,000	.001900	.000133			
13,750	55,000	.002333	.000433	.000733	.000633	
14,000	56,000	.004100	.001767			
14,250	57,000	.005067	.000967			
14,500	58,000	.006000	.000933			
14,750	59,000	.007067	.001067			
15,000	60,000	.008433	.001366	.006367	.005634	
15,250	61,000	.009233	.000800			
15,500	62,000	.009833	.000600			
15,750	63,000	.010433	.000600			
16,000	64,000	.011633	.001200			
16,250	65,000	.012900	.001267	.010433	.004066	
16,500	66,000	.013433	.000533			
16,750	67,000	.014267	.000834			
17,000	68,000	.015667	.001400			
17,250	69,000	.016767	.001100			
17,500	70,000	.018067	.001300	.015533	.005100	
18,000	72,000	.020100	.002033			
18,500	74,000	.022733	.002633			
19,000	76,000	.025500	.002767			
19,500	78,000	.028333	.002833			
20,000	80,000	.031667	.003334			
20,500	82,000	.035000	.003333			
21,000	84,000	.039000	.004000			
21,500	86,000	.043167	.004167			
22,000	88,000	.049000	.005833			
22,500	90,000	.056000	.007000			
23,000	92,000	.064333	.008333			
23,500	94,000	.077667	.013334			Micrometer removed.
24,000	96,000	.1167 .1433	.039033 .0266			Ultimate strength.
21,500						Load at time of rupture.

General summary.

Specific gravity	7.8365
Hardness	20.14
Tensile strength per square inch of original section .... pounds..	96,000
Elastic limit per square inch of original section .... do....	53,000
Elongation per inch after rupture .... inch..	0.1933
Elongation per inch under strain of elastic limit .... do....	.001767
Reduction in diameter at point of rupture .... do....	.114
Reduction in area after rupture, per centum of original section	36.4

Position of rupture .... ″.40 from middle of stem
Character of broken surface, fine granular 40 per cent.; dull silky 60 per cent. fine surface cracks along the stem.
Elongation of inch sections .... ″.18 (″.25 fractured section), ″.20

No. 414.

Tension Test.

Marks on bar, $^{10}_{2}S_{1}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000467	.000134	0.	....	
6,250	25,000	.000567	.000200	0.	....	
7,500	30,000	.000800	.000133	0.	....	
8,750	35,000	.000933	.000133	0.	....	
10,000	40,000	.001100	.000167	0.	....	
10,250	41,000	.001133	.000033	....	....	
10,500	42,000	.001167	.000034	....	....	
10,750	43,000	.001200	.000033	....	....	
11,000	44,000	.001233	.000033	....	....	
11,250	45,000	.001267	.000034	0.	....	
11,500	46,000	.001300	.000033	....	....	
11,750	47,000	.001333	.000033	....	....	
12,000	48,000	.001367	.000034	....	....	
12,250	49,000	.001400	.000033	....	....	
12,500	50,000	.001433	.000033	0.	....	
12,750	51,000	.001400	.000067	....	....	
13,000	52,000	.001433	.000033	....	....	
13,250	53,000	.001467	.000034	....	....	
13,500	54,000	.001500	.000033	....	....	
13,750	55,000	.001567	.000067	.000033	.000033	Elastic limit.
14,000	56,000	.001733	.000166	....	....	
14,250	57,000	.002100	.000367	....	....	
14,500	58,000	.002633	.000533	....	....	
14,750	59,000	.003400	.000767	....	....	
15,000	60,000	.005100	.001700	.003000	.002967	
15,250	61,000	.005633	.000533	....	....	
15,500	62,000	.006333	.000700	....	....	
15,750	63,000	.007267	.000934	....	....	
16,000	64,000	.008433	.001166	....	....	
16,250	65,000	.009500	.001067	.007100	.004100	
16,500	66,000	.010467	.000967	....	....	
16,750	67,000	.011100	.000633	....	....	
17,000	68,000	.012300	.001200	....	....	
17,250	69,000	.013267	.000967	....	....	
17,500	70,000	.014467	.001200	.011933	.004833	
18,000	72,000	.016367	.001900	....	....	
18,500	74,000	.019433	.003066	....	....	
19,000	76,000	.020933	.001500	....	....	
19,500	78,000	.023167	.002234	....	....	
20,000	80,000	.025667	.002500	....	....	
20,500	82,000	.028167	.002500	....	....	
21,000	84,000	.031667	.003500	....	....	
21,500	86,000	.035267	.003600	....	....	
22,000	88,000	.039333	.004066	....	....	
22,500	90,000	.044000	.004667	....	....	
23,000	92,000	.049333	.005333	....	....	
23,500	94,000	.057333	.008000	....	....	
24,000	96,000	.065500	.008167	....	....	
24,500	98,000	.083333	.017833	....	....	
24,620	98,480	....	....	....	....	Ultimate strength.

Broke suddenly under the maximum load.

General summary.

Tensile strength per square inch of original section	pounds..	98,480
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.0933
Elongation per inch under strain at elastic limit	do....	.001567
Reduction in diameter at point of rupture	do....	.034
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		".85 from middle of stem

Character of broken surface, fine granular, radiating from a dull spot at the circumference. Fine surface cracks along the stem.

Elongation of inch sections .... ".09 (".11 fractured section), .08

TESTS OF IRON AND STEEL.

No. 415.

Tension Test.

Marks on bar, $^{10}\frac{S_1}{8}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	.000033	....	
6,250	25,000	.000767	.000167	.000033	....	
7,500	30,000	.000933	.000166	.000033	....	
8,750	35,000	.001033	.000100	.000033	....	
10,000	40,000	.001233	.000200	.000033	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000033	.000033	
11,500	46,000	.001400	0.	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001500	.000033	....	....	Elastic limit.
12,500	50,000	.001600	.000100	.000133	.000100	
12,750	51,000	.001733	.000133	....	....	
13,000	52,000	.001867	.000134	....	....	
13,250	53,000	.002533	.000666	....	....	
13,500	54,000	.004700	.002167	....	....	
13,750	55,000	.005733	.001033	.003800	.003667	
14,000	56,000	.006600	.000867	....	....	
14,250	57,000	.007267	.000667	....	....	
14,500	58,000	.008333	.001066	....	....	
14,750	59,000	.009067	.000734	....	....	
15,000	60,000	.010367	.001300	.008167	.004367	
15,250	61,000	.011100	.000733	....	....	
15,500	62,000	.011767	.000667	....	....	
15,750	63,000	.012933	.001166	....	....	
16,000	64,000	.014167	.001234	....	....	
16,250	65,000	.015100	.000933	.012733	.004566	
16,500	66,000	.016367	.001267	....	....	
16,750	67,000	.016967	.000600	....	....	
17,000	68,000	.018400	.001433	....	....	
17,250	69,000	.019500	.001100	....	....	
17,500	70,000	.021133	.001633	.018400	.005667	
18,000	72,000	.022900	.001767	....	....	
18,500	74,000	.025667	.002767	....	....	
19,000	76,000	.030000	.004333	....	....	
19,500	78,000	.033000	.003000	....	....	
20,000	80,000	.036400	.003400	....	....	
20,500	82,000	.040267	.003867	....	....	
21,000	84,000	.044667	.004400	....	....	
21,500	86,000	.050000	.005333	....	....	
22,000	88,000	.058333	.008333	....	....	
22,500	90,000	.069000	.010667	....	....	
23,000	92,000	.091000	.022000	....	....	
23,400	93,600	.1267	.0357	....	....	Ultimate strength.

General summary.

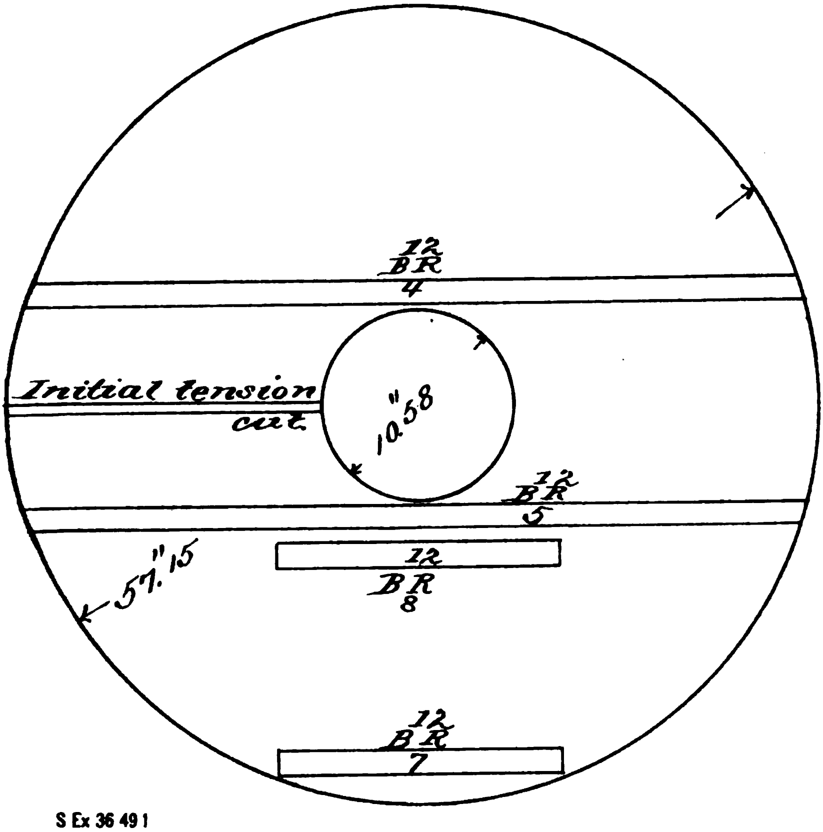
Tensile strength per square inch of original section....................pounds.. 93,600
Elastic limit per square inch of original section....................do.... 49,000
Elongation per inch after rupture....................inch... 0.1500
Elongation per inch under strain at elastic limit....................do.... .001500
Reduction in diameter at point of rupture....................do.... .054
Reduction in area after rupture, per centum of original section.................... 18.8
Position of rupture...................."50 from middle of stem
Character of broken surface, granular, radiating from a dull spot at circumference. Numerous surface cracks along the stem.
The metal at the dull spot resembles a fracture along a gas bubble imperfectly welded.
Elongation of inch sections...................."13 (".20 fractured section), ".12

6.—12″ CAST-IRON B. L. RIFLE.

[Cast-iron specimens from breech and muzzle rings.]

12" Cast Iron B.L. Rifle

Breech Ring



S Ex 36 49 1

No. 422.

Tension Test.

Marks, $B\overset{12}{\underset{4}{}}R$

Diameter, 1″.129.

Sectional area, 1 square inch.

Length, 25″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000012	.000012	0.	....	
2,000	2,000	.000056	.000044	0.	....	
3,000	3,000	.000116	.000060	0.	....	
4,000	4,000	.000176	.000060	0.	....	
5,000	5,000	.000216	.000040	.000004	.000004	
6,000	6,000	.000280	.000064	.000008	.000004	
7,000	7,000	.000324	.000044	.000012	.000004	
8,000	8,000	.000388	.000064	.000020	.000008	
9,000	9,000	.000444	.000056	.000036	.000016	
10,000	10,000	.000504	.000060	.000040	.000004	
11,000	11,000	.000564	.000060	.000048	.000008	
12,000	12,000	.000632	.000068	.000052	.000004	
13,000	13,000	.000696	.000064	.000076	.000024	
14,000	14,000	.000772	.000076	.000088	.000012	
15,000	15,000	.000844	.000072	.000112	.000024	
16,000	16,000	.000928	.000084	.000124	.000012	
17,000	17,000	.001020	.000092	.000152	.000028	
18,000	18,000	.001112	.000092	.000188	.000036	
19,000	19,000	.001200	.000088	.000208	.000020	
20,000	20,000	.001296	.000096	.000244	.000036	
21,000	21,000	.001408	.000112	.000288	.000044	
22,000	22,000	.001532	.000124	.000364	.000076	
23,000	23,000	.001688	.000156	.000440	.000076	
24,000	24,000	.001864	.000176	.000540	.000100	
25,000	25,000	....	....	....	....	Ultimate strength.

General summary.

Specific gravity.. 7.2394
Hardness.. 15.82
Tensile strength per square inch of original section........................pounds.. 25,000
Elastic limit per square inch of original section........................not well defined
Position of rupture.. 9″ from neck
Character of broken surface..granular, mottled

Sustained the maximum load ½ minute, then fractured.

No. 423.

Tension Test.

Marks on bar, $\overset{12}{\underset{5}{\text{B R}}}$
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 25″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000012	.000012	0.	....	
2,000	2,000	.000048	.000036	0.	....	
3,000	3,000	.000112	.000064	0.	....	
4,000	4,000	.000152	.000040	0.	....	
5,000	5,000	.000204	.000052	0.	....	
6,000	6,000	.000260	.000056	.000004	.000004	
7,000	7,000	.000316	.000056	.000008	.000004	
8,000	8,000	.000356	.000040	.000012	.000004	
9,000	9,000	.000432	.000076	.000020	.000008	
10,000	10,000	.000488	.000056	.000036	.000016	
11,000	11,000	.000552	.000064	.000040	.000004	
12,000	12,000	.000608	.000056	.000052	.000012	
13,000	13,000	.000680	.000072	.000064	.000012	
14,000	14,000	.000752	.000072	.000080	.000016	
15,000	15,000	.000828	.000076	.000088	.000008	
16,000	16,000	.000896	.000068	.000116	.000028	
17,000	17,000	.000988	.000092	.000124	.000008	
18,000	18,000	.001072	.000084	.000160	.000036	
19,000	19,000	.001160	.000088	.000188	.000028	
20,000	20,000	.001248	.000088	.000212	.000024	
21,000	21,000	.001360	.000112	.000264	.000052	
22,000	22,000	.001480	.000120	.000324	.000060	
23,000	23,000	.001608	.000128	.000368	.000044	
24,000	24,000	.001748	.000140	.000440	.000072	
25,000	25,000	.002004	.000256	.000640	.000200	
26,000	26,000	.002232	.000228	.000800	.000160	
26,970	26,970	....	....	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section ....pounds..	26,970
Elastic limit per square inch of original section ....pounds..	not well defined
Position of rupture	9″.70 from neck
Character of broken surface	coarse granular, mottled

No. 412.

Compression Test.

Marks on bar, $\overset{12}{\underset{7}{\text{B R}}}$
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	0.	....	
3,000	3,000	.000090	.000040	0.	....	
4,000	4,000	.000140	.000050	0.	....	
5,000	5,000	.000180	.000040	.000010	.000010	
6,000	6,000	.000220	.000040	.000010	0.	
7,000	7,000	.000270	.000050	.000020	.000010	
8,000	8,000	.000310	.000040	.000020	0.	
9,000	9,000	.000360	.000050	.000020	0.	
10,000	10,000	.000410	.000050	.000030	.000010	
11,000	11,000	.000470	.000060	.000040	.000010	
12,000	12,000	.000510	.000040	.000050	.000010	
13,000	13,000	.000570	.000060	.000060	.000010	
14,000	14,000	.000610	.000040	.000070	.000010	
15,000	15,000	.000670	.000060	.000080	.000010	
16,000	16,000	.000710	.000040	.000090	.000010	
17,000	17,000	.000770	.000060	.000090	0.	
18,000	18,000	.000820	.000050	.000100	.000010	
19,000	19,000	.000870	.000050	.000110	.000010	
20,000	20,000	.000930	.000060	.000120	.000010	
21,000	21,000	.001010	.000080	.000120	0.	
22,000	22,000	.001060	.000050	.000140	.000020	
23,000	23,000	.001120	.000060	.000170	.000030	
24,000	24,000	.001190	.000070	.000180	.000010	
25,000	25,000	.001240	.000050	.000190	.000010	
26,000	26,000	.001320	.000080	.000220	.000030	
27,000	27,000	.001410	.000090	.000240	.000020	
28,000	28,000	.001490	.000080	.000280	.000010	Perceptible deflection.
29,000	29,000	.001580	.000090	.000330	.000050	
30,000	30,000	.001680	.000100	.000400	.000070	
31,000	31,000	.001850	.000170	.000490	.000090	
32,000	32,000	.001970	.000120	.000580	.000090	
33,000	33,000	.002180	.000210	.000720	.000140	
34,000	34,000	.002440	.000260	.000920	.000200	
35,000	35,000	.002780	.000340	.001210	.000290	
36,000	36,000	.003180	.000400	.001570	.000360	
37,000	37,000	.003580	.000400	.001910	.000340	
38,000	38,000	.003980	.000400	.002280	.000370	
39,000	39,000	.004530	.000350	.002760	.000480	
40,000	40,000	.003210	.000680	.003870	.000010	
49,980	49,980	....	....	....	....	Ultimate strength.

No. 413.

Compression Test

Marks on bar, $\overset{12}{\underset{8}{\text{B R}}}$

Length, 12″.

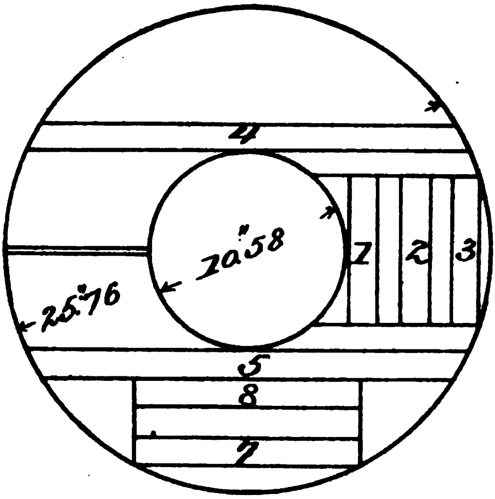
Diameter, 1″.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000050	.000050	0.	....	
3,000	3,000	.000100	.000050	0.	....	
4,000	4,000	.000140	.000040	0.	....	
5,000	5,000	.000180	.000040	0.	....	
6,000	6,000	.000230	.000050	0.	....	
7,000	7,000	.000280	.000050	.000010	.000010	
8,000	8,000	.000330	.000050	.000020	.000010	
9,000	9,000	.000380	.000050	.000020	0.	
10,000	10,000	.000430	.000050	.000030	.000010	
11,000	11,000	.000480	.000050	.000030	0.	
12,000	12,000	.000530	.000050	.000040	.000010	
13,000	13,000	.000600	.000070	.000040	0.	
14,000	14,000	.000650	.000050	.000050	.000010	
15,000	15,000	.000700	.000050	.000070	.000020	
16,000	16,000	.000770	.000070	.000080	.000010	
17,000	17,000	.000830	.000060	.000080	0.	
18,000	18,000	.000870	.000040	.000090	.000010	
19,000	19,000	.000940	.000070	.000090	0.	
20,000	20,000	.001010	.000070	.000100	.000010	
21,000	21,000	.001080	.000070	.000110	.000010	
22,000	22,000	.001140	.000060	.000120	.000010	
23,000	23,000	.001200	.000060	.000140	.000020	
24,000	24,000	.001280	.000080	.000160	.000020	
25,000	25,000	.001350	.000070	.000180	.000020	
26,000	26,000	.001430	.000080	.000200	.000020	
27,000	27,000	.001520	.000090	.000230	.000030	
28,000	28,000	.001590	.000070	.000260	.000030	
29,000	29,000	.001680	.000090	.000290	.000030	
30,000	30,000	.001780	.000100	.000330	.000040	
31,000	31,000	.001870	.000090	.000390	.000060	
32,000	32,000	.002000	.000130	.000460	.000070	
33,000	33,000	.002130	.000130	.000530	.000070	
34,000	34,000	.002290	.000160	.000630	.000100	
35,000	35,000	.002480	.000190	.000770	.000140	Perceptible deflection.
36,000	36,000	.002680	.000200	.000890	.000120	
37,000	37,000	.002880	.000200	.001050	.000160	
38,000	38,000	.003120	.000240	.001270	.000220	
39,000	39,000	.003400	.000280	.001480	.000210	
40,000	40,000	.003710	.000310	.001720	.000240	
52,960	52,960	....	....	....	....	Ultimate strength.

12" Cast Iron B. L. Rifle

Muzzle Ring



Marks, 12″ C I R
M R.

No. of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Square inch.*	*Pounds.*	*Pounds.*	
622	*1	1.129	1.00	33,400	33,400	Coarse granular.
623	2	1.129	1.00	33,080	33,080	Coarse granular.
624	3	1.120	1.00	32,340	32,340	Coarse granular.

* Hardness, 15.91; specific gravity, 7.3115.

No. 627.

Marks, 12″ C I R
M R
No. 4.

Diameter, 1″.129.

Sectional area, 1 square inch.

This specimen has in its stem a piece of a wrought-iron chaplet reducing the sectional area of the cast iron at this place 20 per cent.

At 1,000 pounds tension snapping sounds were heard and the cast and wrought iron began to separate.

Tensile strength, 14,200 pounds.

Fracture occurred 5½″ from the neck, at the wrought iron. The cast iron had a granular appearance.

No. 628.

Marks, 12″ C I R / M R / No. 5.
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 15″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000047	.000047	0.	....	
3,000	3,000	.000113	.000066	0.	....	
4,000	4,000	.000160	.000047	0.	....	
5,000	5,000	.000201	.000041	0.	....	
6,000	6,000	.000273	.000072	0.	....	
7,000	7,000	.000327	.000054	0.	....	
8,000	8,000	.000400	.000073	0.	....	
9,000	9,000	.000460	.000060	0.	....	
10,000	10,000	.000527	.000067	0.	....	
11,000	11,000	.000593	.000066	.000013	.000013	
12,000	12,000	.000660	.000067	.000020	000007	
13,000	13,000	.000720	.000060	.000027	.000007	
14,000	14,000	.000800	.000080	.000067	.000040	
15,000	15,000	.000880	.000080	.000074	.000007	
16,000	16,000	.000960	.000080	.000080	.000006	
17,000	17,000	.001033	.000073	.000127	.000047	
18,000	18,000	.001133	.000100	.000160	.000033	
19,000	19,000	.001267	.000134	.000193	.000033	
20,000	20,000	.001393	.000126	.000253	.000060	
21,000	21,000	.001533	.000140	.000333	.000080	
22,000	22,000	.001727	.000194	.000413	.000080	
23,000	23,000	.001953	.000226	.000553	.000140	
24,000	24,000	.002240	.000287	.000793	.000240	
25,000	25,000	.002587	.000347	.001060	.000267	
26,000	26,000	.002967	.000380	.001333	.000273	
27,000	27,000	.003407	.000440	.001680	.000347	
28,000	28,000	.004013	.000606	.002193	.000513	
29,000	29,000	.004740	.000727	.002807	.000614	
30,000	30,000	.005627	.000887	.003607	.000800	
30,120	30,120	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section..................................pounds . 30,120
Position of rupture.. 1″.1 from neck
Character of broken surface........... ..... Coarse granular, with spot of lighter colored compact metal

No. 497.

Marks, 12 C I R
M R
No. 7.
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	....	....	
3,000	3,000	.000120	.000050	....	....	
4,000	4,000	.000170	.000050	....	....	
5,000	5,000	.000210	.000040	0.	....	
6,000	6,000	.000260	.000050	....	....	
7,000	7,000	.000320	.000060	....	....	
8,000	8,000	.000380	.000060	....	....	
9,000	9,000	.000420	.000040	....	....	
10,000	10,000	.000480	.000060	.000030	.000030	
11,000	11,000	.000530	.000050	....	....	
12,000	12,000	.000600	.000070	....	....	
13,000	13,000	.000660	.000060	....	....	
14,000	14,000	.000720	.000060	....	....	
15,000	15,000	.000780	.000060	.000090	.000060	
16,000	16,000	.000830	.000050	....	....	
17,000	17,000	.000890	.000060	....	....	
18,000	18,000	.000980	.000090	....	....	
19,000	19,000	.001030	.000070	....	....	
20,000	20,000	.001120	.000070	.000140	.000050	
21,000	21,000	.001190	.000070	....	....	
22,000	22,000	.001270	.000080	....	....	
23,000	23,000	.001370	.000100	....	....	
24,000	24,000	.001440	.000070	....	....	
25,000	25,000	.001520	.000080	.000280	.000140	
26,000	26,000	.001620	.000100	....	....	
27,000	27,000	.001730	.000110	....	....	
28,000	28,000	.001890	.000160	....	....	
29,000	29,000	.002000	.000110	....	....	
30,000	30,000	.002180	.000180	.000660	.000380	
31,000	31,000	.002380	.000200	....	....	
32,000	32,000	.002600	.000220	....	....	
33,000	33,000	.002870	.000270	....	....	
34,000	34,000	.003180	.000310	....	....	
35,000	35,000	.003420	.000240	.001700	.001040	
36,000	36,000	.003800	.000380	....	....	
37,000	37,000	.004150	.000350	....	....	
38,000	38,000	.004600	.000450	....	....	
39,000	39,000	.005130	.000530	....	....	
40,000	40,000	.005020	.000790	.008870	.002170	
....	....	....	....	....	Deflection in 10″.	
41,000	41,000		.000080	....	0.	
42,000	42,000	.0060	.0010	....	0.	
43,000	43,000	.0070	.0010	....	.01	
44,000	44,000	.0080	.0005	....	.02	
45,000	45,000	.0085	.0005	....	.03	
46,000	46,000	.0090	.0005	....	.04	
47,000	47,000	.0095	.0005	....	.05	
48,000	48,000	.0100	.0010	....	.07	
49,000	49,000	.0110	.0010	....	.10	
50,000	50,000	.0120	.0010	....	.12	
51,000	51,000	.0130	.0010	....	.15	
52,000	52,000	.0140	.0020	....	.17	
52,460	52,460	.0160	.0030	....	.25	Ultimate strength.
		.0190				

No. 498.

Marks, 12 C I R / M R / No. 8.
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

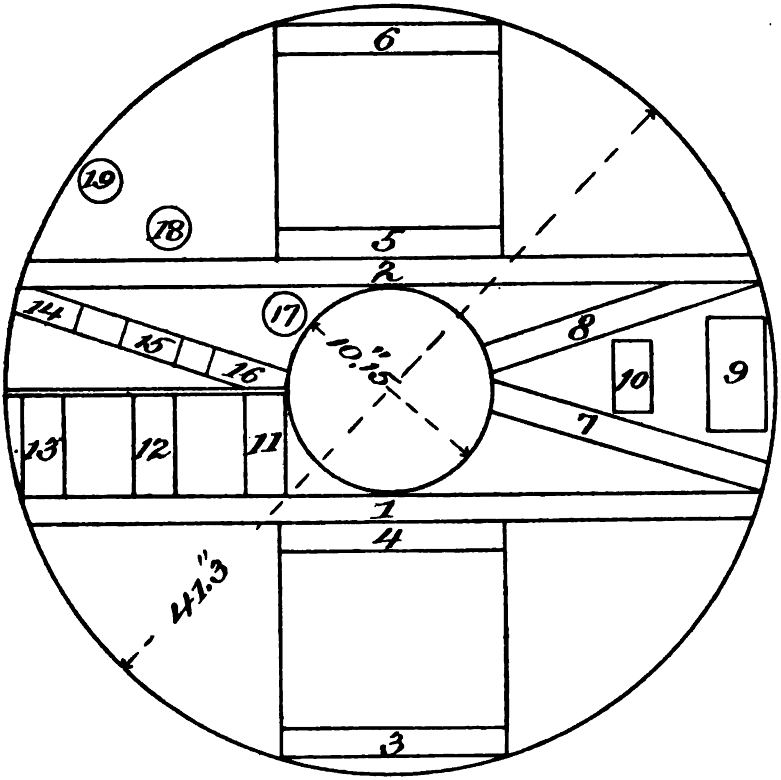
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	....	....	
3,000	3,000	.000110	.000040	....	....	
4,000	4,000	.000170	.000060	....	....	
5,000	5,000	.000210	.000040	.0	....	
6,000	6,000	.000260	.000050	....	....	
7,000	7,000	.000310	.000050	....	....	
8,000	8,000	.000360	.000050	....	....	
9,000	9,000	.000420	.000060	....	....	
10,000	10,000	.000470	.000050	.000030	.000030	
11,000	11,000	.000520	.000050	....	....	
12,000	12,000	.000580	.000060	....	....	
13,000	13,000	.000640	.000060	....	....	
14,000	14,000	.000700	.000060	....	....	
15,000	15,000	.000760	.000060	.000090	.000060	
16,000	16,000	.000820	.000060	....	....	
17,000	17,000	.000870	.000050	....	....	
18,000	18,000	.000950	.000080	....	....	
19,000	19,000	.001020	.000070	....	....	
20,000	20,000	.001080	.000060	.000110	.000020	
21,000	21,000	.001130	.000050	....	....	
22,000	22,000	.001210	.000080	....	....	
23,000	23,000	.001290	.000080	....	....	
24,000	24,000	.001380	.000090	....	....	
25,000	25,000	.001470	.000090	.000260	.000150	
26,000	26,000	.001600	.000130	....	....	
27,000	27,000	.001680	.000080	....	....	
28,000	28,000	.001780	.000100	....	....	
29,000	29,000	.001920	.000140	....	....	
30,000	30,000	.002070	.000150	.000580	.000320	
31,000	31,000	.002280	.000210	....	....	
32,000	32,000	.002480	.000200	....	....	
33,000	33,000	.002700	.000220	....	....	
34,000	34,000	.002950	.000250	....	....	
35,000	35,000	.003280	.000330	.002610	.002060	
36,000	36,000	.003670	.000390	....	....	
37,000	37,000	.003950	.000280	....	....	
38,000	38,000	.004450	.000500	....	....	
39,000	39,000	.004970	.000520	....	....	
40,000	40,000	.005420	.000450	.003420	.000780	
					Deflection in 10″.	
41,000	41,000	.0060	.000580	....	0.	
42,000	42,000	.0070	.0010	....	0.	
43,000	43,000	.0080	.0010	....	0.	
44,000	44,000	.0090	.0010	....	0.	
45,000	45,000	.0095	.0005	....	0.	
46,000	46,000	.0100	.0005	....	.01	
47,000	47,000	.0105	.0005	....	.01	
48,000	48,000	.0110	.0005	....	.02	
49,000	49,000	.0115	.0005	....	.03	
50,000	50,000	.0120	.0005	....	.04	
51,000	51,000	.0130	.0010	....	.05	
52,000	52,000	.0140	.0010	....	.07	
53,000	53,000	.0145	.0005	....	.08	
54,000	54,000	.0150	.0005	....	.20	Ultimate strength.

7.—12″ B. L. RIFLE. CAST-IRON BODY, HOOPED AND TUBED WITH STEEL.

[Cast iron specimens from breech and muzzle rings of body, and steel specimens from tube, hoops, and breech-bushing.]

12" B.L. Rifle
Cast Iron Body
Hooped and Tubed with Steel

Breech ring
Cast Iron



No. 625.

Marks, 12″ H & T
B R
No. 1

Diameter, 1″ .129.
Sectional area, 1 square inch.
Length, 20″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000040	.000040	0.	....	
3,000	3,000	.000090	.000050	0.	....	
4,000	4,000	.000145	.000055	0.	....	
5,000	5,000	.000195	.000050	0.	....	
6,000	6,000	.000245	.000050	0.	....	
7,000	7,000	.000270	.000025	0.	....	
8,000	8,000	.000340	.000070	0.	....	
9,000	9,000	.000395	.000055	0.	....	
10,000	10,000	.000465	.000070	0.	....	
11,000	11,000	.000545	.000080	.000010	.000010	
12,000	12,000	.000615	.000070	.000015	.000005	
13,000	13,000	.000705	.000090	.000030	.000015	
14,000	14,000	.000785	.000080	.000045	.000015	
15,000	15,000	.000865	.000080	.000050	.000005	
16,000	16,000	.000960	.000095	.000090	.000040	
17,000	17,000	.001070	.000110	.000120	.000030	
18,000	18,000	.001190	.000120	.000170	.000050	
19,000	19,000	.001315	.000125	.000220	.000050	
20,000	20,000	.001470	.000155	.000285	.000065	
21,000	21,000	.001645	.000175	.000385	.000100	
22,000	22,000	.001890	.000245	.000520	.000135	
23,000	23,000	.002170	.000280	.000715	.000195	
23,790	23,790	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... **pounds.. 23,790**
Position of rupture .... **5″.00 from the middle**
Character of broken surface .... **coarse granula**

No. 626.

Marks, 12" H & T
B R
No. 2
Diameter, 1".129.
Sectional area, 1 square inch.
Length, 20".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000015	.000015	0.	....	
3,000	3,000	.000080	.000065	0.	....	
4,000	4,000	.000150	.000070	0.	....	
5,000	5,000	.000210	.000060	0.	....	
6,000	6,000	.000270	.000060	0.	....	
7,000	7,000	.000335	.000065	0.	....	
8,000	8,000	.000405	.000070	0.	....	
9,000	9,000	.000470	.000065	.000010	.000010	
10,000	10,000	.000560	.000090	.000020	.000010	
11,000	11,000	.000610	.000050	.000025	.000005	
12,000	12,000	.000685	.000075	.000040	.000015	
13,000	13,000	.000755	.000070	.000055	.000015	
14,000	14,000	.000820	.000065	.000060	.000005	
15,000	15,000	.000910	.000090	.000080	.000020	
16,000	16,000	.001005	.000095	.000105	.000025	
17,000	17,000	.001100	.000095	.000140	.000035	
18,000	18,000	.001200	.000100	.000165	.000025	
19,000	19,000	.001320	.000120	.000225	.000060	
20,000	20,000	.001480	.000160	.000300	.000075	
21,000	21,000	.001660	.000180	.000395	.000095	
22,000	22,000	.001895	.000235	.000545	.000150	
23,000	23,000	.002100	.000205	.000770	.000225	
24,000	24,000	.002505	.000405	.000975	.000205	
25,000	25,000	.003090	.000585	.001505	.000530	
26,000	26,000	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 26,000
Position of rupture..5".00 from middle of stem
Character of broken surface ....coarse granular

No. 491.

Compression Test.

Marks on bar, $\overset{12'' \text{ H \& T}}{\underset{3}{\text{B R}}}$

Length, 12″.

Diameter, 1″.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.	....	
3,000	3,000	.000100	.000030	0.	....	
4,000	4,000	.000160	.000060	0.	....	
5,000	5,000	.000210	.000050	0.	....	
6,000	6,000	.000260	.000050	.000010	.000010	
7,000	7,000	.000310	.000050	.000010	0.	
8,000	8,000	.000360	.000050	.000010	0.	
9,000	9,000	.000410	.000050	.000010	0.	
10,000	10,000	.000460	.000050	.000020	.000010	
11,000	11,000	.000510	.000050	.000030	.000010	
12,000	12,000	.000560	.000050	.000030	0.	
13,000	13,000	.000610	.000050	.000040	.000010	
14,000	14,000	.000670	.000060	.000050	.000010	
15,000	15,000	.000710	.000040	.000070	.000020	
16,000	16,000	.000770	.000060	.000070	0.	
17,000	17,000	.000830	.000060	.000080	.000010	
18,000	18,000	.000890	.000060	.000090	.000010	
19,000	19,000	.000970	.000080	.000110	.000020	
20,000	20,000	.001030	.000060	.000130	.000020	
21,000	21,000	.001110	.000080	.000150	.000020	
22,000	22,000	.001180	.000070	.000170	.000020	
23,000	23,000	.001230	.000050	.000180	.000010	
24,000	24,000	.001320	.000090	.000210	.000030	
25,000	25,000	.001420	.000100	.000260	.000050	
26,000	26,000	.001520	.000100	.000300	.000040	
27,000	27,000	.001620	.000100	.000360	.000060	
28,000	28,000	.001780	.000160	.000440	.000080	
29,000	29,000	.001900	.000120	.000540	.000100	
30,000	30,000	.002080	.000180	.000640	.000100	
31,000	31,000	.002270	.000190	.000800	.000160	
32,000	32,000	.002490	.000220	.000970	.000170	
33,000	33,000	.002780	.000290	.001200	.000230	
34,000	34,000	.003130	.000350	.001500	.000300	
35,000	35,000	.003490	.000360	.001810	.000310	
36,000	36,000	.003860	.000370	.002160	.000350	
37,000	37,000	.004290	.000430	.002540	.000380	
38,000	38,000	.004810	.000520	.002990	.000450	
39,000	39,000	.005220	.000410	.003380	.000390	
40,000	40,000	.005620	.000400	.003720	.000340	
					Deflection in 10″.	
41,000	41,000	.0060	.000380	....	.02	
42,000	42,000	.0070	.0010	....	.03	
43,000	43,000	.0080	.0010	....	.03	
44,000	44,000	.0090	.0010	....	.04	
45,000	45,000	.0100	.0010	....	.04	
46,000	46,000	.0105	.0005	....	.04	
47,000	47,000	.0110	.0005	....	.05	
48,000	48,000	.0115	.0005	....	.05	
49,000	49,000	.0120	.0005	....	.06	
50,000	50,000	.0125	.0005	....	.07	
51,000	51,000	.0130	.0005	....	.08	
52,000	52,000	.0140	.0010	....	.14	
52,080	52,080	....	....	....	....	Ultimate strength.

No. 492.

Compression Test.

Marks on bar, $\begin{matrix}\text{12'' H \& T}\\ \text{B R}\\ \text{No. 4}\end{matrix}$

Length, 12''.

Diameter, 1''.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000060	.000060	0.	....	
3,000	3,000	.000100	.000040	0.	....	
4,000	4,000	.000160	.000060	0.	....	
5,000	5,000	.000210	.000050	0.	....	
6,000	6,000	.000260	.000050	....	....	
7,000	7,000	.000310	.000050	....	....	
8,000	8,000	.000370	.000060	....	....	
9,000	9.000	.000420	.000050	....	....	
10,000	10,000	.000480	.000060	.000030	.000030	
11,000	11,000	.000520	.000040	....	....	
12,000	12,000	.000590	.000070	....	....	
13,000	13,000	.000640	.000050	....	....	
14,000	14,000	.000720	.000080	....	....	
15,000	15,000	.000760	.000040	.000080	.000050	
16,000	16,000	.000820	.000060	....	....	
17,000	17,000	.000890	.000070	....	....	
18,000	18,000	.000950	.000060	....	....	
19,000	19,000	.001030	.000080	....	....	
20,000	20,000	.001090	.000060	.000120	.000040	
21,000	21,000	.001180	.000090	....	....	
22,000	22,000	.001220	.000040	....	....	
23,000	23,000	.001320	.000100	....	....	
24,000	24,000	.001390	.000070	....	....	
25,000	25,000	.001490	.000100	.000280	.000160	
26,000	26,000	.001590	.000100	....	....	
27,000	27,000	.001690	.000100	....	....	
28,000	28,000	.001820	.000130	....	....	
29,000	29,000	.001940	.000120	....	....	
30,000	30,000	.002080	.000140	.000610	.000330	
31,000	31,000	.002270	.000190	....	....	
32,000	32,000	.002130	.000160	....	....	
33,000	33,000	.002680	.000250	....	....	
34,000	34,000	.002950	.000270	....	....	
35,000	35,000	.003270	.000320	.001520	.000910	
36,000	36,000	.003650	.000380	....	....	
37,000	37,000	.004030	.000380	....	....	
38,000	38,000	.004580	.000550	....	....	
39,000	39,000	.004910	.000330	....	....	
40,000	40,000	.005630	.000720	.003590	.002070	
					Deflection in 10''.	
41,000	41,000	.0060	.000370	....	0.	
42,000	42,000	.0070	.0010	....	0.	
43,000	43,000	.0080	.0010	....	0.	
44,000	44,000	.0085	.0005	....	.01	
45,000	45,000	.0090	.0005	....	.04	
46,000	46,000	.0100	.0010	....	.06	
47,000	47,000	.0110	.0010	....	.10	
48,000	48,000	.0120	.0010	....	.13	
49.000	49,000	.0140	.0020	....	.15	
50,000	50,000	.0180	.0040	....	.16	Ultimate strength.

No. 493.

Marks, 12″ H & T
B R
No. 5.
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1, 000	1, 000	0.	0.	0.	0.	Initial load.
2, 000	2, 000	.000070	.000070	....	....	
3, 000	3, 000	.000110	.000040	....	....	
4, 000	4, 000	.000180	.000070	....	....	
5, 000	5, 000	.000220	.000040	0.	....	
6, 000	6, 000	.000280	.000060	....	....	
7, 000	7, 000	.000320	.000040	....	....	
8, 000	8, 000	.000380	.000060	....	....	
9, 000	9, 000	.000430	.000050	....	....	
10, 000	10, 000	.000480	.000050	.000020	.000020	
11, 000	11, 000	.000540	.000060	....	....	
12, 000	12, 000	.000620	.000080	....	....	
13, 000	13, 000	.000670	.000050	....	....	
14, 000	14, 000	.000720	.000050	....	....	
15, 000	15, 000	.000770	.000050	.000090	.000070	
16, 000	16, 000	.000820	.000050	....	....	
17, 000	17, 000	.000890	.000070	....	....	
18, 000	18, 000	.000980	.000090	....	....	
19, 000	19, 000	.001030	.000050	....	....	
20, 000	20, 000	.001100	.000070	.000130	.000040	
21, 000	21, 000	.001180	.000080	....	....	
22, 000	22, 000	.001230	.000050	....	....	
23, 000	23, 000	.001310	.000080	....	....	
24, 000	24, 000	.001410	.000100	....	....	
25, 000	25, 000	.001490	.000080	.000280	.000150	
26, 000	26, 000	.001590	.000100	....	....	
27, 000	27, 000	.001680	.000090	....	....	
28, 000	28, 000	.001820	.000140	....	....	
29, 000	29, 000	.001930	.000110	....	....	
30, 000	30, 000	.002100	.000170	.000610	.000330	
31, 000	31, 000	.002280	.000180	....	....	
32, 000	32, 000	.002450	.000170	....	....	
33, 000	33, 000	.002680	.000230	....	....	
34, 000	34, 000	.002930	.000250	....	....	
35, 000	35, 000	.003270	.000340	.001520	.000910	
36, 000	36, 000	.003600	.000330	....	....	
37, 000	37, 000	.003950	.000350	....	....	
38, 000	38, 000	.004480	.000530	....	....	
39, 000	39, 000	.004980	.000500	....	....	
40, 000	40, 000	.005700	.000720	.003610	.002000	
					Deflection in 10″.	
41, 000	41, 000	.0070	.0013	....	.02	
42, 000	42, 000	.0080	.0010	....	.03	
43, 000	43, 000	.0090	.0010	....	.05	
44, 000	44, 000	.0100	.0010	....	.07	
45, 000	45, 000	.0110	.0010	....	.09	
46, 000	46, 000	.0120	.0010	....	.12	
47, 000	47, 000	.0140	.0020	....	.16	
48, 000	48, 000	.0160	.0020	....	.20	
48, 660	48, 660	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section .... pounds..	48, 660
Manner of failure	triple flexure.

No. 494.

Marks, 12″ H & T B R No. 6

Length, 12″.

Diameter, 1″.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	....	....	
3,000	3,000	.000110	.000040	....	....	
4,000	4,000	.000170	.000060	....	....	
5,000	5,000	.000220	.000050	.000010	.000010	
6,000	6,000	.000270	.000050	....	....	
7,000	7,000	.000320	.000050	....	....	
8,000	8,000	.000380	.000060	....	....	
9,000	9,000	.000430	.000050	....	....	
10,000	10,000	.000480	.000050	.000050	.000040	
11,000	11,000	.000520	.000040	....	....	
12,000	12,000	.000580	.000060	....	....	
13,000	13,000	.000630	.000050	....	....	
14,000	14,000	.000690	.000060	....	....	
15,000	15,000	.000750	.000060	.000090	.000040	
16,000	16,000	.000820	.000070	....	....	
17,000	17,000	.000860	.000040	....	....	
18,000	18,000	.000920	.000060	....	....	
19,000	19,000	.000990	.000070	....	....	
20,000	20,000	.001070	.000080	.000140	.000050	
21,000	21,000	.001110	.000040	....	....	
22,000	22,000	.001200	.000090	....	....	
23,000	23,000	.001270	.000070	....	....	
24,000	24,000	.001350	.000080	....	....	
25,000	25,000	.001430	.000080	.000280	.000140	
26,000	26,000	.001540	.000110	....	....	
27,000	27,000	.001640	.000100	....	....	
28,000	28,000	.001750	.000110	....	....	
29,000	29,000	.001890	.000140	....	....	
30,000	30,000	.002040	.000150	.000630	.000350	
31,000	31,000	.002240	.000200	....	....	
32,000	32,000	.002480	.000240	....	....	
33,000	33,000	.002710	.000230	....	....	
34,000	34,000	.003020	.000310	....	....	
35,000	35,000	.003400	.000380	.001830	.001200	
36,000	36,000	.003790	.000390	....	....	
37,000	37,000	.004180	.000390	....	....	
38,000	38,000	.004580	.000400	....	....	
39,000	39,000	.004990	.000410	....	....	
40,000	40,000	.005500	.000510	.003600	.001770	
					Deflection in 10″.	
41,000	41,000	.0060	.0005	....	0.	
42,000	42,000	.0070	.0010	....	0.	
43,000	43,000	.0080	.0010	....	0.	
44,000	44,000	.0085	.0005	....	.01	
45,000	45,000	.0090	.0005	....	.02	
46,000	46,000	.0100	.0010	....	.04	
47,000	47,000	.0110	.0010	....	.07	
48,000	48,000	.0120	.0010	....	.09	
49,000	49,000	.0140	.0020	....	.10	
50,000	50,000	.0150	.0010	....	.12	
51,000	51,000	.0160	.0010	....	.14	
52,000	52,000	.0200	.0040	....	.22	Ultimate strength.

No. 495.

Marks, 12″ H & T
B R
No. 7
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.
Specific gravity, 7.3080.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000080	.000080	....	....	
3,000	3,000	.000120	.000040	....	....	
4,000	4,000	.000170	.000050	....	....	
5,000	5,000	.000220	.000050	.000030	.000030	
6,000	6,000	.000270	.000050	....	....	
7,000	7,000	.000320	.000050	....	....	
8,000	8,000	.000370	.000050	....	....	
9,000	9,000	.000420	.000050	....	....	
10,000	10,000	.000470	.000050	.000050	000020	
11,000	11,000	.000520	.000050	....	....	
12,000	12,000	.000570	.000050	....	....	
13,000	13,000	.000620	.000050	....	....	
14,000	14,000	.000670	.000050	....	....	
15,000	15,000	.000730	.000060	.000080	.000030	
16,000	16,000	.000800	.000070	....	....	
17,000	17,000	.000840	.000040	....	....	
18,000	18,000	.000900	.000060	....	....	
19,000	19,000	.000970	.000070	....	....	
20,000	20,000	.001020	.000050	.000130	.000050	
21,000	21,000	.001090	.000070	....	....	
22,000	22,000	.001160	.000070	....	....	
23,000	23,000	.001250	.000090	....	....	
24,000	24,000	.001310	.000060	....	....	
25,000	25,000	.001400	.000090	.000240	.000110	
26,000	26,000	.001490	.000090	....	....	
27,000	27,000	.001600	.000110	....	....	
28,000	28,000	.001700	.000100	....	....	
29,000	29,000	.001830	.000130	....	....	
30,000	30,000	.001980	.000150	.000560	.000350	
31,000	31,000	.002190	.000210	....	....	
32,000	32,000	.002360	.000170	....	....	
33,000	33,000	.002580	.000220	....	....	
34,000	34,000	.002910	.000330	....	....	
35,000	35,000	.003210	.000300	.001590	.001000	
36,000	36,000	.003630	.000420	....	....	
37,000	37,000	.003980	.000350	....	....	
38,000	38,000	.004400	.000480	....	....	
39,000	39,000	.004960	.000500	....	....	
40,000	40,000	.005560	.000600	.003650	.002060	
					Deflection in 10″.	
41,000	41,000	.0060	.000440	....	0.	
42,000	42,000	.0070	.0010	....	0.	
43,000	43,000	.0080	.0010	....	.10	
44,000	44,000	.0085	.0005	....	.03	
45,000	45,000	.0090	.0005	....	.05	
46,000	46,000	.0100	.0010	....	.06	
47,000	47,000	.0110	.0010	....	.08	
48,000	48,000	.0130	.0020	....	.13	
49,000	49,000	.0140	.0010	....	.17	
50,000	50,000	.0160	.0020	....	.20	
50,490	50,490	0180	.0020	....	.25	Ultimate strength.

No. 496.

Marks, $\begin{smallmatrix}\text{12'' H \& T}\\ \text{B R}\\ \text{No. 8}\end{smallmatrix}$
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Rema
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	....	....	
3,000	3,000	.000110	.000040	....	....	
4,000	4,000	.000170	.000060	....	....	
5,000	5,000	.000210	.000040	.000010	.000010	
6,000	6,000	.000250	.000040	....	....	
7,000	7,000	.000300	.000050	....	....	
8,000	8,000	.000370	.000070	....	....	
9,000	9,000	.000420	.000050	....	....	
10,000	10,000	.000470	.000050	.000040	.000030	
11,000	11,000	.000520	.000050	....	....	
12,000	12,000	.000570	.000050	....	....	
13,000	13,000	.000610	.000040	....	....	
14,000	14,000	.000670	.000060	....	....	
15,000	15,000	.000720	.000050	.000080	.000040	
16,000	16,000	.000800	.000080	....	....	
17,000	17,000	.000840	.000040	....	....	
18,000	18,000	.000910	.000070	....	....	
19,000	19,000	.000970	.000060	....	....	
20,000	20,000	.001020	.000050	.000120	.000040	
21,000	21,000	.001100	.000080	....	....	
22,000	22,000	.001180	.000080	....	....	
23,000	23,000	.001240	.000060	....	....	
24,000	24,000	.001320	.000080	....	....	
25,000	25,000	.001410	.000090	.000200	.000140	
26,000	26,000	.001520	.000110	....	....	
27,000	27,000	.001610	.000090	....	....	
28,000	28,000	.001720	.000110	....	....	
29,000	29,000	.001850	.000130	....	....	
30,000	30,000	.001990	.000140	.000610	.000350	
31,000	31,000	.002220	.000230	....	....	
32,000	32,000	.002410	.000190	....	....	
33,000	33,000	.002660	.000250	....	....	
34,000	34,000	.002980	.000320	....	....	
35,000	35,000	.003280	.000300	.001610	.001000	
36,000	36,000	.003650	.000370	....	....	
37,000	37,000	.004100	.000450	....	....	
38,000	38,000	.004580	.000480	....	....	
39,000	39,000	.005100	.000520	....	....	
40,000	40,000	.005580	.000480	.003620	.002010	
					Deflection in 10″.	
41,000	41,000	.0060	.000420	....	0.	
42,000	42,000	.0070	.0010	....	0.	
43,000	43,000	.0075	.0005	....	.02	
44,000	44,000	.0080	.0005	....	.03	
45,000	45,000	.0085	.0005	....	.04	
46,000	46,000	.0090	.0005	....	.06	
47,000	47,000	.0100	.0010	....	.08	
48,000	48,000	.0120	.0020	....	.14	
49,000	49,000	.0140	.0020	....	.16	
50,000	50,000	.0160	.0020	....	.20	
50,720	50,720	.0200	.0040	....	.30	Ultimate str

No. 590.

Muzzle Ring.

Location of specimens same as in breech ring.

Marks, M R
12" H & T
No. 1

Diameter, 1".129.
Sectional area, 1 square inch.
Length, 30".

Applied loads. Total.	Applied loads. Per square inch.	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000020	.000020	0.	....	
2,000	2,000	.000110	.000090	0.	....	
3,000	3,000	.000177	.000067	.000007	.000007	
4,000	4,000	.000230	.000053	.000013	.000006	
5,000	5,000	.000280	.000050	.000013	0.	
6,000	6,000	.000338	.000058	.000013	0.	
7,000	7,000	.000390	.000057	.000013	0.	
8,000	8,000	.000433	.000043	.000020	.000007	
9,000	9,000	.000490	.000057	.000030	.000010	
10,000	10,000	.000533	.000043	.000030	0.	
11,000	11,000	.000583	.000050	.000033	.000003	
12,000	12,000	.000640	.000057	.000040	.000007	
13,000	13,000	.000710	.000070	.000043	.000003	
14,000	14,000	.000783	.000073	.000060	.000017	
15,000	15,000	.000860	.000077	.000073	.000013	
16,000	16,000	.000943	.000083	.000097	.000024	
17,000	17,000	.001027	.000084	.000113	.000016	
18,000	18,000	.001113	.000086	.000140	.000027	
19,000	19,000	.001200	.000087	.000173	.000033	
20,000	20,000	.001320	.000120	.000213	.000040	
21,000	21,000	.001433	.000113	.000260	.000047	
22,000	22,000	.001563	.000130	.000317	.000057	
23,000	23,000	.001730	.000167	.000390	.000073	
24,000	24,000	.001887	.000157	.000493	.000103	
25,000	25,000	.002057	.000170	.000647	.000154	
26,000	26,000	.002347	.000290	.000803	.000156	
26,400	26,400	....	....	....	....	Tensile strength.

General summary.

Hardness		**15.99**
Tensile strength per square inch of original section	**pounds**	**26,400**
Position of rupture		**8" from neck**
Character of broken surface		**coarse granular**

No. 591.

Marks, M R 12″ H & T No. 2
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 30″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	5000	0.	0.	0.	0.	Initial load.
1, 000	1, 000	.000027	.000027	0.	....	
2, 000	2, 000	.000063	.000036	.000003	.000003	
3, 000	3, 000	.000113	.000050	.000003	0.	
4, 000	4, 000	.000170	.000057	.000003	0.	
5, 000	5, 000	.000223	.000053	.000003	0.	
6, 000	6, 000	.000283	.000060	.000003	0.	
7, 000	7, 000	.000343	.000060	.000007	.000004	
8, 000	8, 000	.000390	.000047	.000010	.000003	
9, 000	9, 000	.000447	.000057	.000013	.000003	
10, 000	10, 000	.000507	.000060	.000020	.000007	
11, 000	11, 000	.000577	.000070	.000030	.000010	
12, 000	12, 000	.000633	.000056	.000030	0.	
13, 000	13, 000	.000700	.000067	.000040	.000010	
14, 000	14, 000	.000763	.000063	.000047	.000007	
15, 000	15, 000	.000847	.000084	.000063	.000016	
16, 000	16, 000	.000913	.000066	.000077	.000014	
17, 000	17, 000	.000997	.000084	.000100	.000023	
18, 000	18, 000	.001093	.000096	.000123	.000023	
19, 000	19, 000	.001193	.000100	.000157	.000034	
20, 000	20, 000	.001293	.000100	.000190	.000033	
21, 000	21, 000	.001427	.000134	.000237	.000047	
22, 000	22, 000	.001563	.000136	.000303	.000066	
23, 000	23, 000	.001730	.000167	.000397	.000094	
24, 000	24, 000	.001910	.000180	.000513	.000116	
25, 000	25, 000	.002143	.000233	.000650	.000137	
26, 000	26, 000	.002403	.000260	.000823	.000173	
26, 980	26, 980	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 26, 980
Position of rupture.. 4″ from middle of stem
Character of broken surface.. coarse granular

No. 480.

Compression Test.

Marks on bar 12″ H & T
M R
3

Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.	....	
3,000	3,000	.000110	.000040	0.	....	
4,000	4,000	.000170	.000060	0.	....	
5,000	5,000	.000210	.000040	0.	....	
6,000	6,000	.000270	.000060	.000010	.000010	
7,000	7,000	.000310	.000040	.000010	0.	
8,000	8,000	.000360	.000050	.000020	.000020	
9,000	9,000	.000410	.000050	.000020	0.	
10,000	10,000	.000450	.000040	.000020	0.	
11,000	11,000	.000500	.000050	.000030	.000010	
12,000	12,000	.000550	.000050	.000040	.000010	
13,000	13,000	.000610	.000060	.000050	.000010	
14,000	14,000	.000670	.000060	.000060	.000010	
15,000	15,000	.000710	.000040	.000070	.000010	
16,000	16,000	.000760	.000050	.000080	.000010	
17,000	17,000	.000810	.000050	.000080	0.	
18,000	18,000	.000860	.000050	.000090	.000010	
19,000	19,000	.000930	.000070	.000100	.000010	
20,000	20,000	.001010	.000080	.000100	0.	
21,000	21,000	.001070	.000060	.000120	.000020	
22,000	22,000	.001130	.000060	.000130	.000010	
23,000	23,000	.001180	.000050	.000150	.000020	
24,000	24,000	.001240	.000060	.000170	.000020	
25,000	25,000	.001840	.000100	.000200	.000030	
26,000	26,000	.001410	.000070	.000220	.000020	
27,000	27,000	.001480	.000070	.000260	.000040	
28,000	28,000	.001580	.000100	.000310	.000050	
29,000	29,000	.001690	.000110	.000370	.000060	
30,000	30,000	.001820	.000130	.000440	.000070	
31,000	31,000	.001940	.000120	.000550	.000110	
32,000	32,000	.002120	.000180	.000680	.000130	
33,000	33,000	.002340	.000220	.000790	.000110	
34,000	34,000	.002580	.000240	.000970	.000180	
35,000	35,000	.005870	.000290	.001200	.000230	
36,000	36,000	.003200	.000330	.001490	.000290	
37,000	37,000	.003560	.000360	.001820	.000330	
38,000	38,000	.003900	.000430	.002220	.000400	
39,000	39,000	.004400	.000410	.002540	.000320	
40,000	40,000	.004870	.000470	.002960	.000420	
					Deflection at middle.	
41,000	41,000	.0050	.00030	....	.01 ±	
42,000	42,000	.0060	.0010	....	.01 ±	
43,000	43,000	.0070	.0010	....	.02	
44,000	44,000	.0080	.0010	....	.03	
45,000	45,000	.0090	.0010	....	.06	
46,000	46,000	.0100	.0010	....	.08	
47,000	47,000	.0110	.0010	....	.11	
48,000	48,000	.0120	.0010	....	.12	
49,000	49,000	.0130	.0010	....	.15	
50,000	50,000	.0140	.0010	....	.16	
51,000	51,000	.0150	.0010	....	.18	
52,000	52,000	.0180	.0030	....	.24	
52,100	52,100	....	....	....	....	Ultimate strength.

No. 481.

Compression test.

Marks on bar, 12″ H & T / M R / 4

Length, 12″.

Diameter, 1″.129.

Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000080	.000080	0.	....	
3,000	3,000	.000120	.000040	.000010	.000010	
4,000	4,000	.000170	.000050	.000010	0.	
5,000	5,000	.000220	.000050	.000010	0.	
6,000	6,000	.000270	.000050	.000010	0.	
7,000	7,000	.000320	.000050	.000020	.000010	
8,000	8,000	.000380	.000060	.000030	.000010	
9,000	9,000	.000430	.000050	.000040	.000010	
10,000	10,000	.000490	.000060	.000040	0.	
11,000	11,000	.000540	.000050	.000050	.000010	
12,000	12,000	.000590	.000050	.000060	.000010	
13,000	13,000	.000660	.000070	.000070	.000010	
14,000	14,000	.000720	.000060	.000080	.000010	
15,000	15,000	.000780	.000060	.000090	.000010	
16,000	16,000	.000840	.000060	.000090	0.	
17,000	17,000	.000900	.000060	.000100	.000010	
18,000	18,000	.000960	.000060	.000100	0.	
19,000	19,000	.001020	.000060	.000110	.000010	
20,000	20,000	.001080	.000060	.000130	.000020	
21,000	21,000	.001150	.000070	.000140	.000010	
22,000	22,000	.001210	.000060	.000160	.000020	
23,000	23,000	.001280	.000070	.000180	.000020	
24,000	24,000	.001370	.000090	.000190	.000010	
25,000	25,000	.001450	.000080	.000210	.000020	
26,000	26,000	.001520	.000070	.000240	.000030	
27,000	27,000	.001610	.000090	.000270	.000030	
28,000	28,000	.001690	.000080	.000310	.000040	
29,000	29,000	.001780	.000090	.000350	.000040	
30,000	30,000	.001890	.000110	.000410	.000060	
31,000	31,000	.002010	.000120	.000480	.000070	
32,000	32,000	.002180	.000170	.000560	.000080	
33,000	33,000	.002340	.000160	.000670	.000110	
34,000	34,000	.002480	.000140	.000770	.000100	
35,000	35,000	.002720	.000240	.000940	.000170	
36,000	36,000	.002940	.000220	.001110	.000170	
37,000	37,000	.003220	.000280	.001350	.000240	
38,000	38,000	.003510	.000290	.001580	.000230	
39,000	39,000	.003790	.000280	.001820	.000240	
40,000	40,000	.004160	.000370	.002120	.000300*	
					Deflection at middle.	
41,000	41,000	.0045	.000340	....	.01±	
42,000	42,000	.0050	.0005	....	.01	
43,000	43,000	.0060	.0010	....	.02	
44,000	44,000	.0070	.0010	....	.03	
45,000	45,000	.0080	.0010	....	.03	
46,000	46,000	.0090	.0010	....	.04	
47,000	47,000	.0100	.0010	....	.05	
48,000	48,000	.0110	.0010	....	.08	
49,000	49,000	.0120	.0010	....	.10	
50,000	50,000	.0130	.0010	....	.15	
51,000	51,000	.0140	.0010	....	.21	
52,000	52,000	.0180	.0040	....	.26	
52,020	52,020	....	....	....	....	Ultimate strength.

No. 482.

Compression Tes

Marks on bar, 12″ H & T
M R
5

Length, 12″.
Diameter, 1″.120.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1, 000	1, 000	0.	0.	0.	0.	Initial load.
2, 000	2, 000	.000070	.000070	0.	....	
3, 000	3, 000	.000110	.000110	0.	....	
4, 000	4, 000	.000170	.000060	0.	....	
5, 000	5, 000	.000210	.000040	0.	....	
6, 000	6, 000	.000270	.000060	0.	....	
7, 000	7, 000	.000320	.000050	0.	....	
8, 000	8, 000	.000370	.000050	.000010	.000010	
9, 000	9, 000	.000430	.000060	.000010	0.	
10, 000	10, 000	.000470	.000040	.000020	.000010	
11, 000	11, 000	.000540	.000070	.000020	0.	
12, 000	12, 000	.000590	.000050	.000020	0.	
13, 000	13, 000	.000640	.000050	.000030	.000010	
14, 000	14, 000	.000700	.000060	.000040	.000010	
15, 000	15, 000	.000770	.000070	.000060	.000020	
16, 000	16, 000	.000820	.000050	.000080	.000020	
17, 000	17, 000	.000870	.000050	.000080	0.	
18, 000	18, 000	.000940	.000070	.000090	.000010	
19, 000	19, 000	.001000	.000060	.000100	.000010	
20, 000	20, 000	.001070	.000070	.000110	.000010	
21, 000	21, 000	.001130	.000060	.000120	.000010	
22, 000	22, 000	.001190	.000060	.000140	.000020	
23, 000	23, 000	.001260	.000070	.000150	.000010	
24, 000	24, 000	.001330	.000070	.000170	.000020	
25, 000	25, 000	.001420	.000090	.000190	.000020	
26, 000	26, 000	.001480	.000060	.000220	.000030	
27, 000	27, 000	.001570	.000090	.000250	.000030	
28, 000	28, 000	.001650	.000080	.000280	.000030	
29, 000	29, 000	.001750	.000100	.000330	.000050	
30, 000	30, 000	.001840	.000090	.000370	.000040	
31, 000	31, 000	.001950	.000110	.000430	.000060	
32, 000	32, 000	.002070	.000120	.000500	.000070	
33, 000	33, 000	.002220	.000150	.000580	.000080	
34, 000	34, 000	.002350	.000130	.000670	.000090	
35, 000	35, 000	.002560	.000210	.000810	.000140	
36, 000	36, 000	.002780	.000220	.000980	.000170	
37, 000	37, 000	.003020	.000240	.001180	.000200	
38, 000	38, 000	.003280	.000260	.001380	.000200	
39, 000	39, 000	.003540	.000260	.001600	.000220	
40, 000	40, 000	.003940	.000400	.001930	.000330	
					Deflection at middle.	
41, 000	41, 000	.0040	.000060	....	.01	
42, 000	42, 000	.0050	.0010	....	.02	
43, 000	43, 000	.0060	.0010	....	.04	
44, 000	44, 000	.0065	.0005	....	.05	
45, 000	45, 000	.0065	0.	....	.06	
46, 000	46, 000	.0070	.0005	....	.07	
47, 000	47, 000	.0080	.0010	....	.08	
48, 000	48, 000	.0090	.0010	....	.10	
49, 000	49, 000	.0100	.0010	....	.11	
50, 000	50, 000	.0105	.0005	....	.12	
51, 000	51, 000	.0120	.0015	....	.14	
52, 000	52, 000	.0130	.0010	....	.16	
52, 700	52, 700	....	....	....	....	Ultimate strength.

No. 483.

Compression Test.

Marks on bar, $\overset{12'' \text{ H \& T}}{\underset{6}{\text{M R}}}$

Length, 12".
Diameter, 1".129.
Sectional area. 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000080	.000080	0.	....	
3,000	3,000	.000120	.000040	0.	....	
4,000	4,000	.000170	.000050	0.	....	
5,000	5,000	.000220	.000050	0.	....	
6,000	6,000	.000270	.000050	.000010	.000010	
7,000	7,000	.000310	.000040	.000010	0.	
8,000	8,000	.000370	.000060	.000020	.000010	
9,000	9,000	.000410	.000040	.000020	0.	
10,000	10,000	.000440	.000030	.000030	.000010	
11,000	11,000	.000510	.000070	.000030	0.	
12,000	12,000	.000560	.000050	.000040	.000010	
13,000	13,000	.000610	.000050	.000050	.000010	
14,000	14,000	.000670	.000060	.000060	.000010	
15,000	15,000	.000720	.000050	.000070	.000010	
16,000	16,000	.000760	.000040	.000070	0.	
17,000	17,000	.000820	.000060	.000080	.000010	
18,000	18,000	.000870	.000050	.000080	0.	
19,000	19,000	.000940	.000070	.000090	.000010	
20,000	20,000	.001000	.000060	.000100	.000010	
21,000	21,000	.001070	.000070	.000110	.000010	
22,000	22,000	.001120	.000050	.000130	.000020	
23,000	23,000	.001190	.000070	.000150	.000020	
24,000	24,000	.001260	.000070	.000180	.000030	
25,000	25,000	.001340	.000080	.000200	.000020	
26,000	26,000	.001430	.000090	.000230	.000030	
27,000	27,000	.001490	.000060	.000250	.000020	
28,000	28,000	.001580	.000090	.000280	.000030	
29,000	29,000	.001680	.000100	.000330	.000050	
30,000	30,000	.001810	.000130	.000390	.000060	
31,000	31,000	.001930	.000120	.000490	.000100	
32,000	32,000	.002130	.000200	.000630	.000140	
33,000	33,000	.002290	.000160	.000740	.000110	
34,000	34,000	.002480	.000190	.000870	.000130	
35,000	35,000	.002780	.000300	.001130	.000260	
36,000	36,000	.003100	.000320	.001380	.000250	
37,000	37,000	.003410	.000310	.001670	.000290	
38,000	38,000	.003770	.000360	.001970	.000300	
39,000	39,000	.004110	.000340	.002280	.000310	
40,000	40,000	.004640	.000530	.002730	.000450	
					Deflection at middle.	
41,000	41,000	.0050	.000360	....	.02	
42,000	42,000	.0060	.0010	....	.04	
43,000	43,000	.0065	.0005	....	.05	
44,000	44,000	.0070	.0005	....	.06	
45,000	45,000	.0080	.0010	....	.07	
46,000	46,000	.0085	.0005	....	.09	
47,000	47,000	.0090	.0005	....	.10	
48,000	48,000	.0100	.0010	....	.12	
49,000	49,000	.0110	.0010	....	.14	
50,000	50,000	.0120	.0010	....	.16	
51,000	51,000	.0130	.0010	....	.20	
52,000	52,000	.0150	.0020	....	.25	
52,300	52,300	....	....	....	....	Ultimate strength.

No. 484.

Compression Test.

Marks on bar, 12″ H & T
M R
7

Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.	....	
3,000	3,000	.000120	.000050	0.	....	
4,000	4 000	.000170	.000050	0.	....	
5,000	5,000	.000220	.000050	.000010	.000010	
6,000	6,000	.000270	.000050	.000010	0.	
7,000	7,000	.000310	.000040	.000020	.000010	
8,000	8,000	.000360	.000050	.000030	.000010	
9,000	9,000	.000420	.000060	.000040	.000010	
10,000	10,000	.000460	.000040	.000050	.000010	
11,000	11,000	.000510	.000050	.000050	0.	
12,000	12,000	.000560	.000050	.000060	.000010	
13,000	13,000	.000610	.000050	.000070	.000010	
14,000	14,000	.000660	.000050	.000070	0.	
15,000	15,000	.000720	.000060	.000080	.000010	
16,000	16,000	.000770	.000050	.000090	.000010	
17,000	17,000	.000830	.000060	.000090	0.	
18,000	18,000	.000870	.000040	.000090	0.	
19,000	19,000	.000920	.000050	.000100	.000010	
20,000	20,000	.000970	.000050	.000100	0.	
21,000	21,000	.001050	.000080	.000120	.000020	
22,000	22,000	.001110	.000060	.000140	.000020	
23,000	23,000	.001170	.000060	.000160	.000020	
24,000	24,000	.001220	.000050	.000170	.000010	
25,000	25,000	.001300	.000080	.000160	.000020	
26,000	26,000	.001360	.000060	.000210	.000020	
27,000	27,000	.001430	.000070	.000230	.000020	
28,000	28,000	.001520	.000090	.000260	.000030	
29,000	29,000	.001610	.000090	.000310	.000050	
30,000	30,000	.001710	.000100	.000360	.000050	
31,000	31,000	.001810	.000100	.000420	.000060	
32,000	32,000	.001930	.000120	.000490	.000070	
33,000	33,000	.002080	.000150	.000590	.000100	
34,000	34,000	.002220	.000140	.000690	.000100	
35,000	35,000	.002440	.000220	.000830	.000140	
36,000	36,000	.002680	.000240	.001030	.000200	
37,000	37,000	.002920	.000240	.001220	.000190	
38,000	38,000	.003180	.000260	.001440	.000220	
39,000	39,000	.003620	.000440	.001800	.000360	
40,000	40,000	.003920	.000300	.002100	.000300	
					Deflection at middle.	
41,000	41,000	.0040	.000080	....	.01	
42,000	42,000	.0050	.0010	....	.02	
43,000	43,000	.0060	.0010	....	.03	
44,000	44,000	.0065	.0005	....	.04	
45,000	45,000	.0070	.0005	....	.05	
46,000	46,000	.0075	.0005	....	.06	
47,000	47,000	.0080	.0005	....	.08	
48,000	48,000	.0090	.0010	....	.10	
49,000	49,000	.0095	.0005	....	.14	
50,000	50,000	.0100	.0005	....	.16	
51,000	51,000	.0110	.0010	....	.18	
52,000	52,000	.0130	.0020	....	.20	
53,000	53,000	.0150	.0020	....	.27	Ultimate strength.

No. 485.

Compression Test.

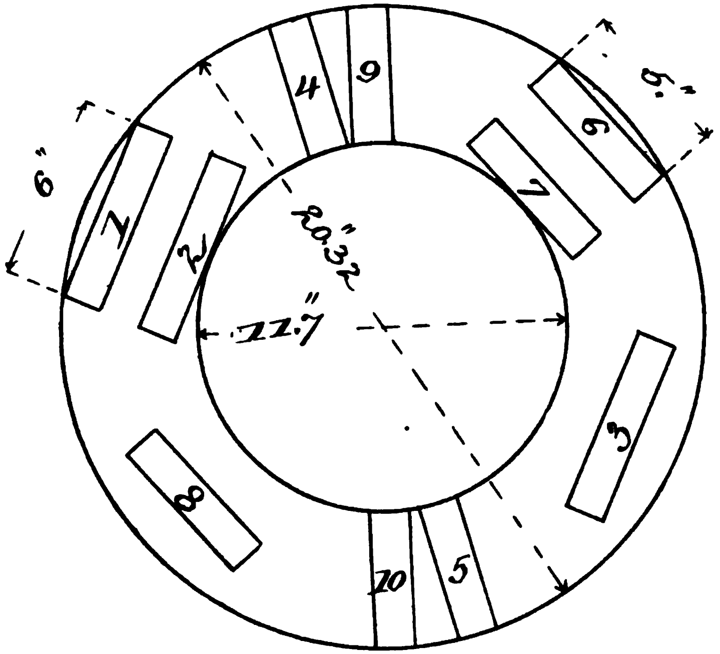
Marks on bar, 12″ H & T / MR / 8

Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Rem
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.	....	
3,000	3,000	.000110	.000040	.000010	.000010	
4,000	4,000	.000160	.000050	.000010	0.	
5,000	5,000	.000210	.000050	.000020	.000010	
6,000	6,000	.000260	.000050	.000030	.000010	
7,000	7,000	.000310	.000050	.000030	0.	
8,000	8,000	.000360	.000050	.000040	.000010	
9,000	9,000	.000390	.000030	.000040	0.	
10,000	10,000	.000430	.000040	.000040	0.	
11,000	11,000	.000490	.000060	.000050	.000010	
12,000	12,000	.000540	.000050	.000050	0.	
13,000	13,000	.000590	.000050	.000060	.000010	
14,000	14,000	.000650	.000060	.000070	.000010	
15,000	15,000	.000720	.000070	.000070	0.	
16,000	16,000	.000760	.000040	.000080	.000010	
17,000	17,000	.000810	.000050	.000090	.000010	
18,000	18,000	.000860	.000050	.000100	.000010	
19,000	19,000	.000910	.000050	.000100	0.	
20,000	20,000	.000980	.000070	.000110	.000010	
21,000	21,000	.001060	.000080	.000120	.000010	
22,000	22,000	.001110	.000050	.000130	.000010	
23,000	23,000	.001160	.000050	.000140	.000010	
24,000	24,000	.001210	.000050	.000150	.000010	
25,000	25,000	.001290	.000080	.000160	.000010	
26,000	26,000	.001360	.000070	.000180	.000020	
27,000	27,000	.001430	.000070	.000210	.000030	
28,000	28,000	.001520	.000090	.000240	.000030	
29,000	29,000	.001590	.000070	.000280	.000040	
30,000	30,000	.001690	.000100	.000320	.000040	
31,000	31,000	.001810	.000120	.000370	.000050	
32,000	32,000	.001910	.000100	.000430	.000060	
33,000	33,000	.002080	.000170	.000540	.000110	
34,000	34,000	.002220	.000140	.000630	.000090	
35,000	35,000	.002430	.000210	.000780	.000150	
36,000	36,000	.002650	.000220	.000970	.000190	
37,000	37,000	.002850	.000200	.001120	.000150	
38,000	38,000	.003140	.000290	.001390	.000270	
39,000	39,000	.003450	.000810	.001620	.000230	
40,000	40,000	.003830	.000380	.001970	.000350	
					Deflection at middle.	
41,000	41,000	.0050	.001170	....	.01−	
42,000	42,000	.0060	.0010	....	.01	
43,000	43,000	.0065	.0005	....	.02	
44,000	44,000	.0070	.0005	....	.02	
45,000	45,000	.0075	.0005	....	.02+	
46,000	46,000	.0080	.0005	....	.025	
47,000	47,000	.0090	.0010	....	.03	
48,000	48,000	.0095	.0005	....	.03+	
49,000	49,000	.0100	.0005	....	.04	
50,000	50,000	.0105	.0005	....	.05	
51,000	51,000	.0110	.0005	....	.07	
52,000	52,000	.0120	.0010	....	.10	
53,000	53,000	.0130	.0010	....	.13	
54,000	54,000	.0140	.0010	....	.17	
54,800	54,800	.0160	.0020	....	.26	Ultimate st

12". B. L. Rifle.
Cast Iron Body
Hooped and Tubed with Steel.

Tube, Whitworth Steel



No. 682½.

Marks, $\frac{12\ \text{H \& T}}{\text{T 1}}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000300	.000200	0.		
3,750	15,000	.000433	.000133	0.		
5,000	20,000	.000633	.000200	0.		
6,250	25,000	.000733	.000100	0.		
7,500	30,000	.000933	.000200	0.		
8,750	35,000	.001100	.000167	0.		
10,000	40,000	.001233	.000133	0.		
10,250	41,000	.001267	.000034			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001367	.000034			
11,250	45,000	.001433	.000066	.000033	.000033	
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	49,000	.001567	.000034			
12,500	50,000	.001633	.000066	.000033	0.	
12,750	51,000	.001667	.000034			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001800	.000067			Elastic limit.
13,750	55,000	.010000	.008200	.007767	.007734	
14,000	56,000	.010567	.000567			
14,250	57,000	.010867	.000300			
14,500	58,000	.011567	.000700			
14,750	59,000	.012500	.000933			
15,000	60,000	.013367	.000867	.011000	.003233	
15,500	62,000	.015567	.002200			
16,000	64,000	.017067	.001500			
16,500	66,000	.018933	.001866			
17,000	68,000	.021333	.002400			
17,500	70,000	.023300	.001967			
18,000	72,000	.025600	.002300			
18,500	74,000	.028333	.002733			
19,000	76,000	.031067	.002734			
19,500	78,000	.034500	.003433			
20,000	80,000	.038067	.003567			
20,500	82,000	.042100	.004033			
21,000	84,000	.047067	.004967			
21,500	86,000	.052500	.005433			
22,000	88,000	.059900	.007400			
22,500	90,000	.068067	.008167			
23,000	92,000	.082067	.014000			
23,500	94,000	.1100	.027933			
23,680	94,720	.1400	.0300			Tensile strength.
21,700						Load at time of rupture.

General summary.

Specific gravity	7.8658
Hardness	18.09
Tensile strength per square inch of original section ....pounds..	94,720
Elastic limit per square inch of original section ....do....	54,000
Elongation per inch after rupture ....inch..	0.2167
Elongation per inch under strain at elastic limit ....do....	.001800
Reduction in diameter at point of rupture ....do....	.124
Reduction in area after rupture, per centum of original section	30.2
Position of rupture	″.35 from middle of stem

Character of broken surface, silky, 60 per cent. fine, granular, radiating from center of broken surface, 40 per cent.

Elongation of inch sections .... ″.17, ″.35*, ″.13

No. 683.

Marks, $^{12}\,{}^{\text{H \& T}}_{\text{T 2}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	....	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000633	.000200	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001267	.000134	0.	....	
10,250	41,000	.001267	0.	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001500	.000033	....	....	
12,000	48,000	.001533	.000033	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001633	.000066	0.	....	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001667	0.	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	0.	....	
14,000	56,000	.001833	.000066	....	....	Elastic limit.
14,250	57,000	.003567	.001734	....	....	
14,500	58,000	.006100	.002533	....	....	
14,750	59,000	.006467	.000367	....	....	
15,000	60,000	.007133	.000666	.004800	.004800	
15,500	62,000	.008067	.000934	....	....	
16,000	64,000	.009433	.001366	....	....	
16,500	66,000	.011333	.001900	....	....	
17,000	68,000	.012800	.001467	....	....	
17,500	70,000	.014333	.001533	....	....	
18,000	72,000	.016067	.001734	....	....	
18,500	74,000	.017633	.001566	....	....	
19,000	76,000	.019500	.001867	....	....	
19,500	78,000	.021333	.001833	....	....	
20,000	80,000	.023600	.002267	....	....	
20,500	82,000	.026033	.002433	....	....	
21,000	84,000	.028333	.002300	....	....	
21,500	86,000	.031533	.003200	....	....	
22,000	88,000	.034933	.003400	....	....	
22,500	90,000	.038333	.003400	....	....	
23,000	92,000	.042333	.004000	....	....	
23,500	94,000	.047067	.004734	....	....	
24,000	96,000	.053000	.005933	....	....	
24,500	98,000	.0600	.0070	....	....	
25,000	100,000	.0733	.0133	....	....	
25,470	101,880	.1000	.0267	....	....	Tensile strength.
24,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	101,880
Elastic limit per square inch of original section	do....	56,000
Elongation per inch after rupture	inch..	0.1100
Elongation per inch under strain at elastic limit	do....	.001833
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		″.3 from neck.
Character of broken surface		granular at circumference; center, rough spongy
Elongation of inch sections		″.17*, ″.08, ″.0

No. 684.

Marks, $^{12''}\frac{\text{H \& T}}{\text{T 3}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000367	.000234	0.	....	
3,750	15,000	.000500	.000133	0.	....	
5,000	20,000	.000667	.000167	.000033	.000033	
6,250	25,000	.000833	.000166	.000033	0.	
7,500	30,000	.001000	.000167	.000033	0.	
8,750	35,000	.001167	.000167	.000067	.000034	
10,000	40,000	.001333	.000166	.000067	0.	
10,250	41,000	.001367	.000034	....	....	
10,500	42,000	.001400	.000033	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001500	.000033	.000067	0.	
11,500	46,000	.001533	.000033	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001633	.000066	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001767	.000100	.000200	.000133	Elastic limit.
12,750	51,000	.007533	.005766	....	....	
13,000	52,000	.008267	.000734	....	....	
13,250	53,000	.008833	.000566	....	....	
13,500	54,000	.009200	.000367	....	....	
13,750	55,000	.010200	.001000	.007933	.007733	
14,000	56,000	.011233	.001033	....	....	
14,250	57,000	.011533	.000300	....	....	
14,500	58,000	.012400	.000867	....	....	
14,750	59,000	.013133	.000733	....	....	
15,000	60,000	.014300	.001167	.011833	.003900	
15,500	62,000	.016667	.002367	....	....	
16,000	64,000	.018000	.001333	....	....	
16,500	66,000	.020000	.002000	....	....	
17,000	68,000	.022333	.002333	....	....	
17,500	70,000	.025067	.002734	....	....	
18,000	72,000	.027733	.002666	....	....	
18,500	74,000	.030933	.003200	....	....	
19,000	76,000	.034200	.003267	....	....	
19,500	78,000	.037900	.003700	....	....	
20,000	80,000	.042267	.004367	....	....	
20,500	82,000	.047167	.004900	....	....	
21,000	84,000	.053667	.006500	....	....	
21,500	86,000	.061167	.007500	....	....	
22,000	88,000	.071200	.010033	....	....	
22,500	90,000	.0867	.0155	....	....	
23,000	92,000	.1267	.0400	....	....	
23,050	92,200	.1467	.0200	....	....	Tensile strength.
21,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	92,200
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1967
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		1″.1 from neck

Character of broken surface, granular, 70 per cent.; dull spongy, reaching from circumference to center, 30 per cent.

Elongation of inch sections.......... ″.23*, ″.24*, ″.12

No. 685.

Marks, $^{12''}\substack{\text{H \& T}\\ \text{T 4}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	.0	.0	0.	0.	Initial load.
1,250	5,000	.000050	.000050	0.		
2,500	10,000	.000200	.000150	0.		
3,750	15,000	.000350	.000150	0.		
5,000	20,000	.000500	.000150	0.		
6,250	25,000	.000650	.000150	0.		
7,500	30,000	.000850	.000200	0.		
8,750	35,000	.001000	.000150	0.		
10,000	40,000	.001200	.000200	0.		
10,250	41,000	.001250	.000050			Elastic limit.
10,500	42,000	.001500	.000250			
10,750	43,000	.002450	.000950			
11,000	44,000	.002850	.000400			
11,250	45,000	.003600	.000750	.002050	.002050	
11,500	46,000	.003900	.000300			
11,750	47,000	.004400	.000500			
12,000	48,000	.005350	.000950			
12,250	49,000	.006000	.000650			
12,500	50,000	.006700	.000700	.004700	.002650	
12,750	51,000	.007300	.000600			
13,000	52,000	.007800	.000500			
13,250	53,000	.008300	.000500			
13,500	54,000	.009300	.001000			
13,750	55,000	.010000	.000700	.007900	.003200	
14,000	56,000	.010850	.000850			
14,250	57,000	.011350	.000500			
14,500	58,000	.012250	.000900			
14,750	59,000	.013000	.000750			
15,000	60,000	.014150	.001150	.011650	.003750	
15,500	62,000	.015750	.001600			
16,000	64,000	.017750	.002000			
16,500	66,000	.019750	.002000			
17,000	68,000	.022000	.002250			
17,500	70,000	.024750	.002750			
18,000	72,000	.027050	.002300			
18,500	74,000	.030000	.002950			
19,000	76,000	.033000	.003000			
19,500	78,000	.036550	.003550			
20,000	80,000	.040600	.004050			
20,500	82,000	.045400	.004800			
21,000	84,000	.051000	.005600			
21,500	86,000	.058250	.007250			
22,000	88,000	.065500	.007250			
22,500	90,000	.077500	.012000			
22,880	91,520	.1000	.0225			Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	91,520
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.1050
Elongation per inch under strain at elastic limit	do....	.001250
Reduction in diameter at point of rupture	do...	.044
Reduction in area after rupture, per centum of original section		15.0
Position of rupture		″.50 from neck
Character of broken surface		granular; a streak of dull-colored metal extends across the broken surface
Elongation of inch sections		″.13*, ″.08

No. 686.

Marks, $^{12}\,\mathrm{H}\,\&\,^{\mathrm{T}}_{\mathrm{T}\,5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000250	.000150	0.	....	
3, 750	15, 000	.000450	.000200	0.	....	
5, 000	20, 000	.000550	.000100	0.	....	
6, 250	25, 000	.000700	.000150	0.	....	
7, 500	30, 000	.000950	.000250	0.	....	
8, 750	35, 000	.001050	.000100	0.	....	
9, 000	36, 000	.001150	.000100	....	....	
9, 250	37, 000	.001200	.000050	....	....	
9, 500	38, 000	.001250	.000050	....	....	
9, 750	39, 000	.001300	.000050	....	....	
10, 000	40, 000	.001350	.000050	....	....	
10, 250	41, 000	.001450	.000100	....	....	Elastic limit.
10, 500	42, 000	.002100	.000650	....	....	
10, 750	43, 000	.002550	.000450	....	....	
11, 000	44, 000	.003250	.000700	....	....	
11, 250	45, 000	.003550	.000300	.002100	.002100	
11, 500	46, 000	.004000	.000450	....	....	
11, 750	47, 000	.004650	.000650	....	....	
12, 000	48, 000	.004950	.000300	....	....	
12, 250	49, 000	.005600	.000650	....	....	
12, 500	50, 000	.006400	.000800	.004600	.002500	
12, 750	51, 000	.006900	.000500	....	....	
13, 000	52, 000	.007550	.000650	....	....	
13, 250	53, 000	.007850	.000300	....	....	
13, 500	54, 000	.009500	.001650	....	....	
13, 750	55, 000	.009700	.000200	.007650	.003050	
14, 000	56, 000	.010400	.000700	....	....	
14, 250	57, 000	.010800	.000400	....	....	
14, 500	58, 000	.011300	.000500	....	....	
14, 750	59, 000	.012100	.000800	....	....	
15, 000	60, 000	.013050	.000950	.010700	.003050	
15, 500	62, 000	.014900	.001850	....	....	
16, 000	64, 000	.016850	.001950	....	....	
16, 500	66, 000	.018800	.001950	....	....	
17, 000	68, 000	.020850	.002050	....	....	
17, 500	70, 000	.023350	.002500	....	....	
18, 000	72, 000	.026050	.002700	....	....	
18, 500	74, 000	.028400	.002350	....	....	
19, 000	76, 000	.031100	.002700	....	....	
19, 500	78, 000	.034950	.003850	....	....	
20, 000	80, 000	.038500	.003550	....	....	
20, 500	82, 000	.043000	.004500	....	....	
21, 000	84, 000	.048250	.005250	....	....	
21, 500	86, 000	.0550	.006750	....	....	
22, 000	88, 000	.0650	.0100	....	....	
22, 500	90, 000	.0750	.0100	....	....	
23, 000	92, 000	.0950	.0200	....	....	
23, 120	92, 480	.1150	.0200	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	92, 480
Elastic limit per square inch of original section	do ..	41, 000
Elongation per inch after rupture	inch..	0.1250
Elongation per inch under strain at elastic limit	do....	.001450
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		at middle of stem

Character of broken surface, granular, 45 per centum; dull spongy surface oblique, with axis of specimen, 55 per centum.

Elongation of inch sections .... ″.14*, ″.11

No. 514.

Marks, $^{12''}\frac{\text{H \& T}}{\text{T 6}}$
Length, 5''.
Diameter, ''.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000067	.000067	0.	....	
5,000	10,000	.000300	.000233	0.	....	
7,500	15,000	.000400	.000100	0.	....	
10,000	20,000	.000567	.000167	0.	....	
12,500	25,000	.000700	.000133	0.	....	
15,000	30,000	.000867	.000167	0.	....	
17,500	25,000	.001033	.000166	0.	....	
20,000	40,000	.001200	.000167	.000033	.000033	
20,500	41,000	.001233	.000033	....	....	
21,000	42,000	.001267	.000034	....	....	
21,500	43,000	.001300	.000033	....	....	
22,000	44,000	.001333	.000033	....	....	
22,500	45,000	.001367	.000034	.000033	0.	
23,000	46,000	.001433	.000066	....	....	
23,500	47,000	.001500	.000067	....	....	
24,000	48,000	.001567	.000067	....	....	Elastic limit.
24,500	49,000	.001667	.000100	....	....	
25,000	50,000	.001833	.000166	.000633	.000600	
25,500	51,000	.004733	.002900	....	....	
26,000	52,000	.005200	.000467	....	....	
26,500	53,000	.005633	.000433	....	....	
27,000	54,000	.006033	.000400	....	....	
27,500	55,000	.006433	.000400	.004500	.003867	
28,000	56,000	.006867	.000434	....	....	
28,500	57,000	.007400	.000533	....	....	
29,000	58,000	.007867	.000467	....	....	
29,500	59,000	.008400	.000533	....	....	
30,000	60,000	.009067	.000667	.006933	.002433	
44,310	88,620	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	48,000
Compression per inch under stress at elastic limit	inch..	0.001567
Ultimate strength per square inch of original section	pounds..	88,620
Manner of failure		triple flexure

No. 515.

Marks, $^{12''\,\mathrm{H\,\&\,T}}_{\mathrm{T}\;7}$
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	
2. 500	5, 000	. 000067	. 000067	0.	....	
5, 000	10, 000	. 000233	. 000166	0.	....	
7, 500	15, 000	. 000400	. 000167	0.	....	
10, 000	20, 000	. 000567	. 000167	0.	....	
12, 500	25, 000	. 000700	. 000133	0.	....	
15, 000	30, 000	. 000667	. 000167	0.	....	
17, 500	35, 000	. 001033	. 000166	0.	....	
20, 000	40, 000	. 001167	. 000134	0.	....	
20, 500	41, 000	. 001200	. 000033	....	....	
21, 000	42, 000	. 001233	. 000033	....	....	
21, 500	43, 000	. 001267	. 000034	....	....	
22, 000	44, 000	. 001300	. 000033	....	....	
22, 500	45, 000	. 001333	. 000033	0.	....	
23, 000	46, 000	. 001367	. 000034	....	....	
23, 500	47, 000	. 001400	. 000033	....	....	
24, 000	48, 000	. 001433	. 000033	....	....	
24, 500	49, 000	. 001433	0.	....	....	
25, 000	50, 000	. 001467	. 000034	0.	....	
25, 500	51, 000	. 001467	0.	....	....	
26, 000	52, 000	. 001500	. 000033	....	....	
26, 500	53, 000	. 001533	. 000033	....	....	
27, 000	54, 000	. 001567	. 000034	....	....	Elastic limit.
27. 500	55, 000	. 001800	. 000233	. 000333	. 000333	
28, 000	56, 000	. 002033	. 000233	....	....	
28, 500	57, 000	. 002367	. 000334	....	....	
29, 000	58, 000	. 003267	. 000900	....	....	
29, 500	59, 000	. 004900	. 001633	....	....	
30, 000	60, 000	. 007333	. 002433	. 005333	. 005000	
44, 790	89, 580	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	54, 000
Compression per inch under stress at elastic limit	inch..	0. 001567
Ultimate strength per square inch of original section	pounds..	89, 580
Manner of failure		triple flexure

No. 516.

Marks, $\overset{12''\ \mathrm{H\ \&\ T}}{\mathrm{T\ 8}}$

Length, 5".

Diameter, ".797.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000267	.000167	0.	....	
7,500	15,000	.000433	.000166	0.	....	
10,000	20,000	.000600	.000167	0.	....	
12,500	25,000	.000767	.000167	.000033	.000033	
15,000	30,000	.000933	.000166	.000033	0.	
17,500	35,000	.001100	.000167	.000033	0.	
20,000	40,000	.001267	.000167	.000067	.000034	
20,500	41,000	.001300	.000033	....	....	
21,000	42,000	.001333	.000033	....	....	
21,500	43,000	.001367	.000034	....	....	
22,000	44,000	.001400	.000033	....	....	
22,500	45,000	.001433	.000033	.000067	0.	
23,000	46,000	.001467	.000034	....	....	Elastic limit.
22,500	47,000	.001567	.000100	....	....	
24,000	48,000	.001700	.000133	....	....	
24,500	49,000	.007167	.005467	....	....	
25,000	50,000	.007500	.000333	.005967	.005900	
25,500	51,000	.007867	.000367	....	....	
26,000	52,000	.008200	.000333	....	....	
26,500	53,000	.009033	.000833	....	....	
27,000	54,000	.009700	.000667	....	....	
27,500	55,000	.010533	.000833	.008500	.002533	
28,000	56,000	.011167	.000634	....	....	
28,500	57,000	.011800	.000633	....	....	
29,000	58,000	.012733	.000933	....	....	
29,500	59,000	.013500	.000767	....	....	
30,000	60,000	.014400	.000900	.012833	.003533	
41,510	83,020	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	46,000
Compression per inch under stress at elastic limit	inch..	0.001467
Ultimate strength per square inch of original section	pounds..	83,020
Manner of failure		triple flexure

No. 517.

Marks, 12″ H & T
T 9
Length, 4″.25.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1, 000	0.	0.	0.	0.	Initial load.
2, 500	5, 000	.000133	.000133	0.	....	
5, 000	10, 000	.000300	.000167	0.	....	
7, 500	15, 000	.000400	.000100	0.	....	
10, 000	20, 000	.000533	.000133	.000033	.000033	
12, 500	25, 000	.000667	.000134	.000033	0.	
15, 000	30, 000	.000833	.000166	.000033	0.	
17, 500	35, 000	.001000	.000167	.000067	.000034	
20, 000	40, 000	.001133	.000133	.000067	0.	
20, 500	41, 000	.001200	.000067	....	....	
21, 000	42, 000	.001233	.000033	....	....	
21, 500	43, 000	.001267	.000034	....	....	
22, 000	44, 000	.001300	.000033	....	....	
22, 500	45, 000	.001333	.000033	.000067	0.	
23, 000	46, 000	.001333	0.	....	....	
23, 500	47, 000	.001367	.000034	....	....	
24, 000	48, 000	.001400	.000033	....	....	
24, 500	49, 000	001433	.000033	....	....	
25, 000	50, 000	.001467	.000034	.000067	0.	Elastic limit.
25, 500	51, 000	.004200	.002733	....	....	
26, 000	52, 000	.005267	.001067	....	....	
26, 500	53, 000	.005867	.000600	....	....	
27, 000	54, 000	.007033	.001166	....	....	
27, 500	55, 000	.007533	.000500	.005567	.005500	
28, 000	56, 000	.007967	.000434	....	....	
28, 500	57, 000	.008400	.000433	....	....	
29, 000	68, 000	.009133	.000733	....	....	
29, 500	59, 000	.009800	.000667	....	....	
30, 000	60, 000	.010533	.000733	.008367	.002800	
51, 050	102, 100	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	50, 007
Compression per inch under stress at elastic limit	inch..	0. 001460
Ultimate strength per square inch of original section	pounds..	102, 100
Manner of failure		triple flexure

No. 518.

Mark, $\overset{12\,\mathrm{H}\ \&\ \mathrm{T}}{\mathrm{T}\ 10}$
Length, 4''.25.
Diameter, ''.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000100	.000100	0.	....	
5,000	10,000	.000233	.000133	0.	....	
7,500	15,000	.000367	.000134	0.	....	
10,000	20,000	.000500	.000133	0.	....	
12,500	25,000	.000667	.000167	0.	....	
15,000	30,000	.000833	.000166	0.	....	
17,500	35,000	.001000	.000167	0.	....	
20,000	40,000	.001067	.000067	0.	....	
20,500	41,000	.001100	.000033	....	....	
21,000	42,000	.001133	.000033	....	....	
21,500	43,000	.001167	.000034	....	....	
22,000	44,000	.001200	.000033	....	....	
22,500	45,000	.001233	.000033	.000033	.000033	
23,000	46,000	.001300	.000067	....	....	
23,500	47,000	.001333	.000033	....	....	
24,000	48,000	.001333	0.	....	....	
24,500	49,000	.001367	.000034	....	....	
25,000	50,000	.001400	.000033	.000067	.000034	
25,500	51,000	.001433	.000033	....	....	Elastic limit.
26,000	52,000	.003500	.002067	....	....	
26,500	53,000	.004300	.000800	....	....	
27,000	54.000	.005000	.000700	....	....	
27,500	55,000	.005567	.000567	.003700	.003633	
28,000	56,000	.006007	.000500	....	....	
28,500	57,000	.006667	.000600	....	....	
29,000	58,000	.007267	.000600	....	....	
29,500	59,000	.007933	.000666	....	....	
30,000	60,000	.008333	.000400	.006333	.002633	
52,170	104,340	....	....	....	....	Ultimate strength.

General summary.

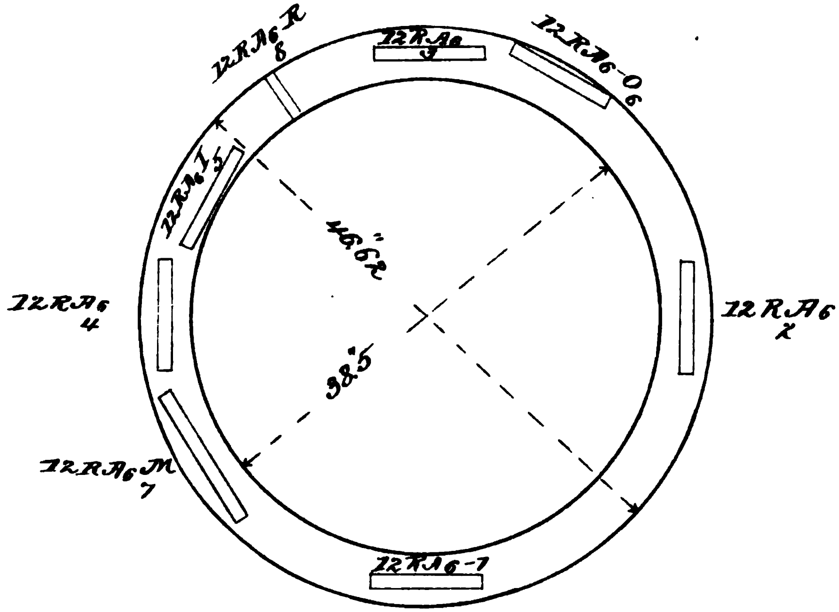
Elastic limit per square inch of original section	**pounds**	**51,000**
Compression per inch under stress at elastic limit	**inch**	**0.001433**
Ultimate strength per square inch of original section	**pounds**	**104,340**
Manner of failure		**triple flexure**

12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop A 6



S Ex 36 49 1

No. 472.

Tension Test.

Marks on bar, $^{12}\mathrm{E}_{1}\mathrm{A}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000150	.000150	.000050	.000050	
2, 500	10, 000	.000317	.000167	.000050	0.	
3, 750	15. 000	.000483	.000166	.000050	0.	
5, 000	20, 060	.000650	.000167	.000050	0.	
6, 250	25, 000	.000817	.000167	.000050	0.	
7, 500	30, 000	.000967	.000150	.000050	0.	
8, 750	35, 000	.001150	.000183	.000050	0.	
10, 000	40, 000	.001317	.000167	.900050	0.	
10, 250	41, 000	.001333	.000016	....	....	
10, 500	42, 000	.001367	.000034	....	....	
10, 750	43, 000	.001400	.000033	....	....	
11, 000	44, 000	.001450	.000050	....	....	
11, 250	45, 000	.001483	.000033	.000050	0.	
11, 500	46, 000	.001517	.000034	....	....	
11, 750	47, 000	001550	.000033	....	....	
12, 000	48. 000	.001617	.000067	....	....	
12, 250	49, 000	.001650	.000033	....	....	
12, 500	50, 000	.001700	.000050	.000067	.000017	
12, 750	51, 000	.001717	.000017	....	....	
13, 000	52, 000	.001750	.000033	....	....	
13, 250	53, 000	.001783	.000033	....	....	
13, 500	54, 000	.001817	.000034	....	....	
13, 750	55, 000	.001883	.000066	.000100	.000033	
14, 000	56, 000	.001967	.000084	....	....	
14, 250	57, 000	.002050	.000083	....	....	Elastic limit.
14, 500	58, 000	.002150	.000100	....	....	
14, 750	59, 000	.002306	.000150	....	....	
15, 000	60, 000	.002633	.000333	.000633	.000583	
15, 500	62, 000	.003333	.000700	....	....	
16, 000	64, 000	.004367	.001034	....	....	
16, 500	66, 000	.005833	.001466	....	....	
17, 000	68, 000	.007500	.001607	....	....	
17, 500	70, 000	.009167	.001667	....	....	
18, 000	72, 000	.010833	.001666	....	....	
18, 500	74, 000	.012583	.001750	....	....	
19, 000	76, 000	.014333	.001750	....	....	
19, 500	78, 000	.016000	.001667	....	....	
20, 000	80, 000	.017833	.001883	....	....	
20, 500	82, 000	.019833	.002000	....	....	
21, 000	84, 000	.021833	.002000	....	....	
21, 500	86, 000	.024167	.002334	....	....	
22, 000	88, 000	.026667	.002500	....	....	
22, 500	90, 000	.029000	.002333	....	....	
23, 000	92, 000	.032000	.003000	....	....	
23, 500	94, 000	.035167	.003167	....	....	
24, 000	96, 000	.038333	.003166	....	....	
24, 500	98, 000	.042667	.004334	....	....	
25, 000	100, 000	.049833	.007166	....	....	
25, 500	102, 000	.0583	.008467	....	....	
26, 000	104, 000	.0650	.0067	....	....	
26, 500	106, 000	.0783	.0133	....	....	
26, 900	107, 600	.1217	.0434	....	....	Ultimate strength.
24, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8577
Hardness	23.03
Tensile strength per square inch of original section..........pounds..	107, 600
Elastic limit per square inch of original section..........do....	57, 000
Elongation per inch after rupture..........inch..	0.1417
Elongation per inch under strain at elastic limit..........do ...	.002050
Reduction in diameter at point of rupture..........do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	″.80 from neck
Character of broken surface	fine granular, with dull center
Elongation of inch sections	(″.27 fractured section), ″.13, ″.10, ″.11, ″.11, ″.13

No. 473.

Tension Test.

Marks on bar, $^{12}\frac{\text{R}}{2}\text{A}_{6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	.000033	.000033	
2,500	10,000	.000300	.000167	.000033	0.	
3,750	15,000	.000467	.000167	.000050	.000017	
5,000	20,000	.000633	.000166	.000050	0.	
6,250	25,000	.000800	.000167	.000050	0.	
7,500	30,000	.000967	.000167	.000050	0.	
8,750	35,000	.001133	.000166	.000067	.000017	
10,000	40,000	.001300	.000167	.000067	0.	
10,250	41,000	.001317	.000017	....	....	
10,500	42,000	.001367	.000050	....	....	
10,750	43,000	.001400	.000033	....	....	
11,000	44,000	.001450	.000050	....	....	
11,250	45,000	.001483	.000033	.000067	0.	
11,500	46,000	.001533	.000050	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001600	.000033	....	....	
12,250	49,000	.001633	.000033	....	....	
12,500	50,000	.001683	.000050	.000083	.000016	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001883	.000083	....	....	
13,750	55,000	.001950	.000067	.000200	.000117	Elastic limit.
14,000	56,000	.002133	.000183	....	....	
14,250	57,000	.002300	.000167	....	....	
14,500	58,000	.002633	.000333	....	....	
14,750	59,000	.003050	.000417	....	....	
15,000	60,000	.003583	.000533	.001617	.001417	
15,500	62,000	.004833	.001250	....	....	
16,000	64,000	.006333	.001500	....	....	
16,500	66,000	.008000	.001667	....	....	
17,000	68,000	.009667	.001667	....	....	
17,500	70,000	.011333	.001666	....	....	
18,000	72,000	.013033	.001700	....	....	
18,500	74,000	.014833	.001800	....	....	
19,000	76,000	.016500	.001667	....	....	
19,500	78,000	.018500	.002000	....	....	
20,000	80,000	.020500	.002000	....	....	
20,500	82,000	.022833	.002333	....	....	
21,000	84,000	.025333	.002500	....	....	
21,500	86,000	.027333	.002000	....	....	
22,000	88,000	.030000	.002667	....	....	
22,500	90,000	.035000	.003000	....	....	
23,000	92,000	.036333	.003333	....	....	
23,500	94,000	.040500	.004167	....	....	
24,000	96,000	.045000	.004500	....	....	
24,500	98,000	.050583	.005583	....	....	
25,000	100,000	.058333	.007750	....	....	
25,500	102,000	.0700	.011667	....	....	
26,000	104,000	.0883	.0183	....	....	
26,120	104,480	.1200	.0317	....	....	Ultimate strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 104,480
Elastic limit per square inch of original section ....do.... 55,000
Elongation per inch after rupture ....inch.. 0.1483
Elongation per inch under strain at elastic limit...do.... .001950
Reduction in diameter at point of rupture..do.... .114
Reduction in area after rupture, per centum of original section 36.4
Position of rupture .... 1″.10 from neck
Character of broken surface.......................................fine granular, with dull center
Elongation of inch sections ....(″.23 fractured section), ″.21, ″.13, ″.11, ″.11, ″.10

No. 474.

Tension Test.

Marks on bar, $^{12}{}^{\mathrm{R}}_{3}\mathrm{A}_4$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000483	.000183	.000033	.000033	
5,000	20,000	.000650	.000167	.000033	0.	
6,250	25,000	.000817	.000167	.000033	0.	
7,500	30,000	.000983	.000166	.000033	0.	
8,750	35,000	.001150	.000167	.000050	.000017	
10,000	40,000	.001317	.000167	.000067	.000017	
10,250	41,000	.001367	.000050	....	....	
10,500	42,000	.001383	.000016	....	....	
10,750	43,000	.001417	.000034	....	....	
11,000	44,000	.001450	.000033	....	....	
11,250	45,000	.001500	.000050	.000067	0.	
11,500	46,000	.001550	.000050	....	....	
12,750	47,000	.001600	.000050	....	....	
12,000	48,000	.001633	.000033	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001683	.000016	.000067	0.	
12,750	51,000	.001717	.000034	....	....	
13,000	52,000	.001767	.000050	....	....	
13,250	53,000	.001800	.000033	....	....	
13,500	54,000	.001850	.000050	....	....	
13,750	55,000	.001900	.000050	.000133	.000066	Elastic limit.
14,000	56,000	.002050	.000150	....	....	
14,250	57,000	.002117	.000067	....	....	
14,500	58,000	.002300	.000183	....	....	
14,750	59,000	.002467	.000167	....	....	
15,000	60,000	.002867	.000400	.000883	.000750	
15,500	62,000	.003717	.000850	....	....	
16,000	64,000	.005000	.001283	....	....	
16,500	66,000	.006667	.001667	....	....	
17,000	68,000	.008333	.001666	....	....	
17,500	70,000	.009833	.001500	....	....	
18,000	72,000	.011667	.001834	....	....	
18,500	74,000	.013167	.001500	....	....	
19,000	76,000	.014833	.001666	....	....	
19,500	78,000	.016583	.001750	....	....	
20,000	80,000	.018533	.001950	....	....	
20,500	82,000	.020500	.001967	....	....	
21,000	84,000	.022667	.002167	....	....	
21,500	86,000	.025000	.002333	....	....	
22,000	88,000	.027333	.002333	....	....	
22,500	90,000	.030167	.002834	....	....	
23,000	92,000	.033333	.003166	....	....	
23,500	94,000	.036500	.003167	....	....	
24,000	96,000	.040000	.003500	....	....	
24.500	98,000	.045000	.005000	....	....	
25,000	100,000	.050083	.005083	....	....	
25,500	102,000	.057633	.007550	....	....	
26,000	104,000	.0700	.012367	....	....	
26,500	106,000	.0933	.0233	....	....	
26,600	106,400	.1100	.0167	....	....	Ultimate strength.
24,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	106,400
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1267
Elongation per inch under strain at elastic limit	do....	.001900
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		at middle of stem
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.08, ″.09, ″.18 (″.23 fractured section), ″.11, ″.90

No. 475.

Tension Test.

Marks on bar, $^{12\,\mathrm{R}\,\mathrm{A}_{6}}_{\quad 4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000683	.000166	0.	....	
6,250	25,000	.000717	.000134	0.	....	
7,500	30,000	.000883	.000166	0.	....	
8,750	35,000	.001050	.000167	0.	....	
10,000	40,000	.001233	.000183	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001317	.000050	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001550	.000050	....	....	
12,500	50,000	.001600	.000050	0.	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	.000050	.000050	
14,000	56,000	.001833	.000066	....	....	
14,250	57,000	.001900	.000067	....	....	Elastic limit.
14,500	58,000	.002100	.000200	....	....	
14,750	59,000	.002350	.000250	....	....	
15,000	60,000	.002767	.000417	.000817	000767	
15,500	62,000	.003967	.001200	....	....	
16,000	64,000	.005633	.001666	....	....	
16,500	66,000	.007333	.001700	....	....	
17,000	68,000	.008917	.001584	....	....	
17,500	70,000	.010667	.001750	....	....	
18,000	72,000	.012333	.001666	....	....	
18,500	74,000	.014167	.001834	....	....	
19,000	76,000	.016083	.001916	....	....	
19,500	78,000	.017667	.001584	....	....	
20,000	80,000	.019750	.002083	....	....	
20,500	82,000	.021917	.002167	....	....	
21,000	84,000	.024333	.002416	....	....	
21,500	86,000	.026833	.002500	....	....	
22,000	88,000	.029467	.002634	....	....	
22,500	90,000	.032467	.003000	....	....	
23,000	92,000	.035667	.003200	....	....	
23,500	94,000	.039583	.003916	....	....	
24,000	96,000	.044333	.004750	....	....	
24,500	98,000	.049533	.005200	....	....	
25,000	100,000	.057417	.007884	....	....	
25,500	102,000	.0683	.010883	....	....	
26,000	104,000	.0900	.0217	....	....	
26,140	104,560	.1133	.0233	....	....	Ultimate strength.
23,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,560
Elastic limit per square inch of original section	do...	57,000
Elongation per inch after rupture	inch..	0.1467
Elongation per inch under strain at elastic limit	do..	.001900
Reduction in diameter at point of rupture	do..	.124
Reduction in area after rupture, per centum, of original section		39.3
Position of rupture		1″.90 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.12 (″.31 fractured section), ″.14, ″.12, ″.11, ″.09

No. 540.

Tension Test.

Marks on bar, $^{12\,\mathrm{R}\,\mathrm{A}_{5}\,\mathrm{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000300	.000183	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.001033	.000216	0.	....	
8,750	35,000	.001183	.000150	0.	....	
10,000	40,000	.001383	.000200	0.	....	
10,250	41,000	.001400	.000017	....	....	
10,500	42,000	.001450	.000050	....	....	
10,750	43,000	.001483	.000033	....	....	
11,000	44,000	.001533	.000050	....	....	
11,250	45,000	.001567	.000034	0.	....	
11,500	46,000	.001617	.000050	....	....	
11,750	47,000	.001650	.000033	....	....	
12,000	48,000	.001683	.000033	....	....	
12,250	49,000	.001717	.000034	....	....	
12,500	50,000	.001783	.000066	0.	....	
12,750	51,000	.001833	.000050	....	....	
13,000	52,000	.001883	.000050	....	....	
13,250	53,000	.001917	.000034	....	....	
13,500	54,000	.001950	.000033	....	....	
13,750	55,000	.001967	.000017	0.	....	
14,000	56,000	.002000	.000033	....	....	
14,250	57,000	.002017	.000017	....	....	
14,500	58,000	.002050	.000033	....	....	
14,750	59,000	.002100	.000050	....	....	
15,000	60,000	.002133	.000033	....	....	
15,250	61,000	.002183	.000050	.0	....	
15,500	62,000	002217	.000034	....	....	
15,750	63,000	.002283	.000066	....	....	
16,000	64,000	.002367	.000084	....	....	
16,250	65,000	.002417	.000050	.000067	.000067	Elastic limit.
16,500	66,000	.002600	.000183	....	....	
16,750	67,000	.002800	.000200	....	....	
17,000	68,000	.003067	.000267	....	....	
17,250	69,000	.003583	.000516	....	....	
17,500	70,000	.004417	.000834	.002000	.001933	
18,000	72,000	.005833	.001116	....	....	
18,500	74,000	.007550	.001717	....	....	
19,000	76,000	.009350	.001800	....	....	
19,500	78,000	.011083	.001733	....	....	
20,000	80,000	.012833	.001750	....	....	
20,500	82,000	.014667	.001834	....	....	
21,000	84,000	.016500	.001833	....	....	
21,500	86,000	.018417	.001917	....	....	
22,000	88,000	.020500	.002083	....	....	
22,500	90,000	.022667	.002167	....	....	
23,000	92,000	.024883	.002216	....	....	
23,500	94,000	.027250	.002367	....	....	
24,000	96,000	.030333	.003083	....	....	
24,500	98,000	.032750	.002417	....	....	
25,000	100,000	.036050	.003300	....	....	
25,500	102,000	.040133	.004083	....	....	
26,000	104,000	.0483	.008167	....	....	
26,500	106,000	.0533	.0050	....	....	
27,000	108,000	.0583	.0050	....	....	
27,500	110,000	.0700	.0117	....	....	
27,950	111,800	.1000	.0300	....	....	Tensile strength.
24,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	111,800
Elastic limit per square inch of original section	do...	65,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit.	do...	.002417
Reduction in diameter at point of rupture	do...	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.9 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		(″.28 fractured section), ″.12, ″.09, ″.09, ″.11, ″.11

No. 541.

Tension Test.

Marks on bar, $12\,\frac{R}{6}\,A.\,O$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	.....	
2,500	10,000	.000333	.000216	0.	.....	
3,750	15,000	.000533	.000200	0.	.....	
5,000	20,000	.000717	.000184	.....	.....	
6,250	25,000	.000933	.000216	.....	.....	
7,500	30,000	.001100	.000167	.....	.....	
8,750	35,000	.001300	.000200	.....	.....	
10,000	40,000	.001500	.000200	.....	.....	
10,250	41,000	.001533	.000033	.....	.....	
10,500	42,000	.001567	.000034	.....	.....	
10,750	43,000	.001600	.000033	.....	.....	
11,000	44,000	.001633	.000033	.....	.....	
11,250	45,000	.001683	.000050	0.	.....	
11,500	46,000	.001717	.000034	.....	.....	
11,750	47,000	.001750	.000033	.....	.....	
12,000	48,000	.001800	.000050	.....	.....	
12,250	49,000	.001833	.000033	.....	.....	
12,500	50,000	.001867	.000034	0.	.....	
12,750	51,000	.001917	.000050	.....	.....	
13,000	52,000	.001967	.000050	.....	.....	
13,250	53,000	.002017	.000050	.....	.....	
13,500	54,000	.002050	.000033	.....	.....	
13,750	55,000	.002100	.000050	0.	.....	
14,000	56,000	.002167	.000067	.....	.....	
14,250	57,000	.002233	.000066	.....	.....	Elastic limit.
14,500	58,000	.002367	.000134	.....	.....	
14,750	59,000	.002500	.000133	.....	.....	
15,000	60,000	.002717	.000217	.000367	.000367	
15,250	61,000	.003000	.000283	.....	.....	
15,500	62,000	.003467	.000467	.....	.....	
15,750	63,000	.003750	.000283	.....	.....	
16,000	64,000	.004500	.000750	.....	.....	
16,250	65,000	.005250	.000750	.....	.....	
16,500	66,000	.006217	.000967	.....	.....	
16,750	67,000	.006833	.000616	.....	.....	
17,000	68,000	.007850	.001017	.....	.....	
17,250	69,000	.009500	.001650	.....	.....	
17,500	70,000	.010500	.001000	.....	.....	
18,000	72,000	.011533	.001033	.....	.....	
18,500	74,000	.012850	.001317	.....	.....	
19,000	76,000	.014667	.001817	.....	.....	
19,500	78,000	.016800	.002133	.....	.....	
20,000	80,000	.018833	.002033	.....	.....	
20,500	82,000	.020917	.002084	.....	.....	
21,000	84,000	.022833	.002116	.....	.....	
21,500	86,000	.025000	.002167	.....	.....	
22,000	88,000	.027500	.002500	.....	.....	
22,500	90,000	.030333	.002833	.....	.....	
23,000	92,000	.033167	.002834	.....	.....	
23,500	94,000	.036500	.003333	.....	.....	
24,000	96,000	.040633	.004133	.....	.....	
24,500	98,000	.045333	.004700	.....	.....	
25,000	100,000	.050750	.005417	.....	.....	
25,500	102,000	.057833	.007083	.....	.....	
26,000	104,000	.0717	.013867	.....	.....	
26,500	106,000	.0983	.0266	.....	.....	
26,560	106,240	.1067	.0084	.....	.....	Tensile strength.
24,000	.....	.....	.....	.....	.....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	106,240
Elastic limit per square inch of original section	do...	57,000
Elongation per inch after rupture	inch..	0.1483
Elongation per inch under strain at elastic limit	do....	.002233
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.25 from middle of stem
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.08, ″.12 (″.29 fractured section) 7″.15, ″.12, ″.13

No. 437.

Compression Test.

Marks on bar, $^{12\,\text{E}\,\text{A}_{7}\,\text{M}}$
Length, 11″.992.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	0.		
10,000	10,000	.000280	.000170	0.		
15,000	15,000	.000420	.000140	0.		
20,000	20,000	.000600	.000180	0.		
25,000	25,000	.000750	.000150	0.		
30,000	30,000	.000920	.000170	0.		
31,000	31,000	.000950	.000030			
32,000	32,000	.000990	.000040			
33,000	33,000	.001010	.000020			
34,000	34,000	.001050	.000040			
35,000	35,000	.001080	.000030	0.		
36,000	36,000	.001100	.000020			
37,000	37,000	.001140	.000040			
38,000	38,000	.001180	.000040			
30,000	39,000	.001210	.000030			
40,000	40,000	.001240	.000030	0.		Perceptible deflection when under maximum load. No deflection when released to initial load.
41,000	41,000	.001280	.000040			
42,000	42,000	.001320	.000040			
43,000	43,000	.001360	.000040			
44,000	44,000	.001400	.000040			
45,000	45,000	.001440	.000040	0.		
46,000	46,000	.001460	.000020			
47,000	47,000	.001480	.000020			
48,000	48,000	.001510	.000030			
49,000	49,000	.001550	.000040			
50,000	50,000	.001580	.000030	.000020	.000020	
51,000	51,000	.001620	.000040			
52,000	52,000	.001660	.000040			
53,000	53,000	.001710	.000050			
54,000	54,000	.001750	.000040			
55,000	55,000	.001800	.000050	.000060	.000040	
56,000	56,000	.001860	.000060			
57,000	57,000	.001910	.000050			
58,000	58,000	.001980	.000070			Elastic limit.
59,000	59,000	.002200	.000220			
60,000	60,000	.002800	.000600	.000770	.000710 Deflection chord 10″.	
61,000	61,000	.003480	.000680			
62,000	62,000	.005420	.000940			
63,000	63,000	.006780	.001360			
64,000	64,000	.0090	.002220		.13	
65,000	65,000	.0110	.0020		.16	
65,250	65,250	.0170	.0060		.20	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds	58,000
Compression per inch under stress at elastic limit	inch	0.001980
Ultimate strength per square inch of original section	pounds	65 250
Manner of failure		triple flexure

After passing the maximum load the deflection was continued, bending the bar 180° over a radius of its own diameter, when it fractured.

The fracture began at a small dull spot at the outside of, and quartering with the bend. The fractured surface was granular, radiating from the dull spot.

Along the cylindrical surface seamy metal was observed before the test; this was on the outside of the bend after deflecting.

No. 443.

Compression Tests.

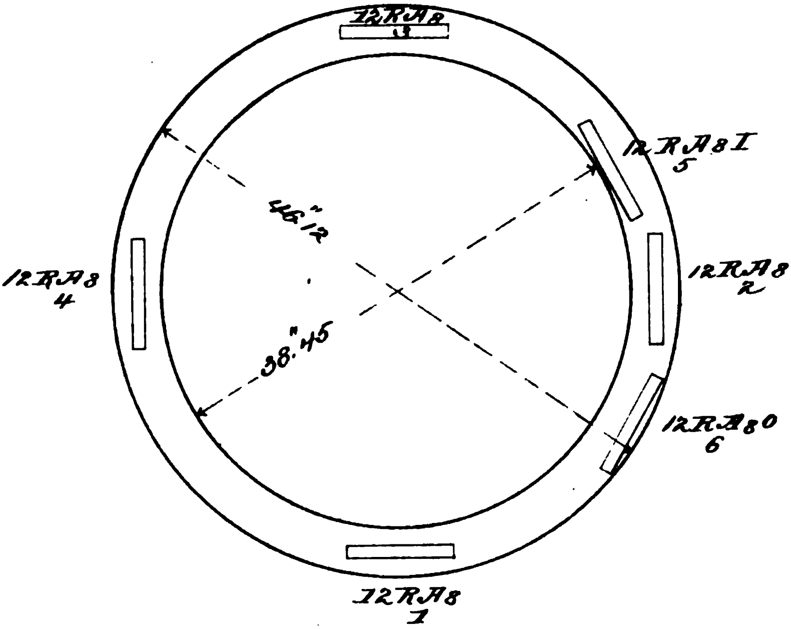
Marks on bar, $^{12\,B}{}_{8}{}^{A,\,B}$
Length, 3".54.
Diameter, ".367.
Sectional area, .106 square inch.
Ultimate strength, 7,740 pounds=73,020 pounds per square inch.
Failed by triple flexure.
Bent 130°, then fractured.
Appearance fine granular, dull smoky spot at circumference on the tension side of the bend.

12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop A8



No. 471.

Tension Test.

Marks on bar, $^{12}\underset{4}{R}A_{3}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001083	.000183	0.	....	
10,000	40,000	.001250	.000167	0.	....	
10,250	41,000	.001283	.000033	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001383	.000050	....	....	
11,250	45,000	.001417	.000034	0.	....	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001500	.000050	....	....	
12,000	48,000	.001567	.000067	....	....	
12,250	49,000	.001633	.000066	....	....	Elastic limit.
12,500	50,000	.001800	.000167	.000200	.000200	
12,750	51,000	.002167	.000367	....	....	
13,000	52,000	.002483	.000316	....	....	
13,250	53,000	.002833	.000350	....	....	
13,500	54,000	.003333	.000500	....	....	
13,750	55,000	.004000	.000667	.002083	.001883	
14,000	56,000	.004667	.000667	....	....	
14,250	57,000	.005250	.000583	....	....	
14,500	58,000	.005833	.000583	....	....	
14,750	59,000	.006667	.000834	....	....	
15,000	60,000	.007333	.000666	.005183	.003100	
15,500	62,000	.008833	.001500	....	....	
16,000	64,000	.010333	.001500	....	....	
16,500	66,000	.012000	.001667	....	....	
17,000	68,000	.013667	.001667	....	....	
17,500	70,000	.015500	.001833	....	....	
18,000	72,000	.017333	.001833	....	....	
18,500	74,000	.019167	.001834	....	....	
19,000	76,000	.021500	.002333	....	....	
19,500	78,000	.024133	.002633	....	....	
20,000	80,000	.025583	.001450	....	....	
20,500	82,000	.027833	.002250	....	....	
21,000	84,000	.030833	.003000	....	....	
21,500	86,000	.033833	.003000	....	....	
22,000	88,000	.037167	.003334	....	....	
22,500	90,000	.041500	.004333	....	....	
23,000	92,000	.046500	.005000	....	....	
23,500	94,000	.052333	.005833	....	....	
24,000	96,000	.057333	.005000	....	....	
24,500	98,000	.067500	.010167	....	....	
25,000	100,000	.0867	.0192	....	....	
25,320	101,280	.1383	.0516	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section.................................pounds.. 101,280
Elastic limit per square inch of original section ....do.... 49,000
Elongation per inch after rupture..inch.. 0.1517
Elongation per inch under strain at elastic limit...do.... .001633
Reduction in diameter at point of rupture...do.... .104
Reduction in area after rupture, per centum of original section 33.5
Position of rupture ....″.90 from neck
Character of broken surface ....fine granular, with dull center
Elongation of inch sections..............................(″.28 fractured section), ″.14, ″.11, ″.11, ″.13, ″.14

No. 542.

Tension Test.

Marks on bar, $^{12}\mathrm{R}^{\mathrm{A},\,\mathrm{I}}_{5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000233	.000116	0.	....	
3,750	15,000	.000383	.000150	0.	....	
5,000	20,000	.000550	.000167	0.	....	
6,250	25,000	.000717	.000167	0.	....	
7,500	30,000	.000967	.000250	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001317	.000184	0.	....	
10,250	41,000	.001350	.000033	....	....	
10,500	42,000	.001400	.000050	....	....	
10,750	43,000	.001450	.000050	....	....	
11,000	44,000	.001483	.000033	....	....	
11,250	45,009	.001517	.000034	0.	....	
11,500	46,000	.001550	.000033	....	....	
11,750	47,000	.001633	.000083	....	....	
12,000	48,000	.001683	.000050	....	....	
12,250	49,000	.001717	.000034	....	....	
12,500	50,000	.001733	.000016	0.	....	
12,750	51,060	.001800	.000067	....	....	
13,000	52,000	.001867	.000067	....	....	Elastic limit.
13,250	53,000	.001950	.000083	....	....	
13,500	54,000	.002183	.000183	....	....	
13,750	55,000	.002483	.000350	.000417	.000417	
14,000	56,000	.002967	.000484	....	....	
14,250	57,000	.003167	.000200	....	....	
14,500	58,000	.003700	.000533	....	....	
14,750	59,000	.004633	.000933	....	....	
15,000	60,000	.005200	.000567	.002733	.002316	
15,500	62,000	.006417	.001217	....	....	
16,000	64,000	.007833	.001416	....	....	
16,500	66,000	.009633	.001800	....	....	
17,000	68,000	.010817	.001184	....	....	
17,500	70,000	.012383	.001566	....	....	
18,000	72,000	.014183	.001800	....	....	
18,500	74,000	.016000	.001817	....	....	
19,000	76,000	.017500	.001500	....	....	
19,500	78,000	.019417	.001917	....	....	
20,000	80,000	.021333	.001916	....	....	
20,500	82,000	.023500	.002167	....	....	
21,000	84,000	.025833	.002333	....	....	
21,500	86,000	.028333	.002500	....	....	
22,000	88,000	.031167	.002834	....	....	
22,500	90,000	.033850	.002683	....	....	
23,000	92,000	.037667	.003817	....	....	
23,500	94,000	.041083	.003416	....	....	
24,000	96,000	.045533	.004450	....	....	
24,500	98,000	.051417	.005884	....	....	
25,000	100,000	.059250	.007833	....	....	
25,500	102,000	.0733	.014050	....	....	
26,000	104,000	.0983	.0250	....	....	
26,100	104,400	.1133	.0150	....	....	Tensile strength.
24,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,400
Elastic limit per square inch of original section	do ...	52,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do ...	.001867
Reduction in diameter at point of rupture	do ...	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.75 from middle of stem
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.10, ″.12, ″.12 (″.30 fractured section), ″.13, ″.09

No. 543.

Tension Test.

Marks on bar, $^{12}\mathrm{R}^{\mathrm{A}}_{6}{}^{\mathrm{O}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000350	.000283	0.	....	
3,750	15,000	.000567	.000217	0.	....	
5,000	20,000	.000800	.000233	0.	....	
6,250	25,000	.000983	.000183	0.	....	
7,500	30,000	.001167	.000184	0.	....	
8,750	35,000	.001367	.000200	0.	....	
10,000	40,000	.001600	.000233	0.	....	
10,250	41,000	.001633	.000033	....	....	
10,500	42,000	.001667	.000034	....	....	
10,750	43,000	.001700	.000033	....	....	
11,000	44,000	.001733	.000033	....	....	
11,250	45,000	.001767	.000034	0.	....	
11,500	46,000	.001800	.000033	....	....	
11,750	47,000	.001850	.000050	....	....	
12,000	48,000	.001883	.000033	....	....	
12,250	49,000	.001950	.000067	....	....	
12,500	50,000	.001983	.000033	0.	....	
12,750	51,000	.002033	.000050	....	....	
13,000	52,000	.002067	.000034	....	....	
13,250	53,000	.002100	.000033	....	....	Elastic limit.
13,500	54,000	.002183	.000083	....	....	
13,750	55,000	.002283	.000100	.000067	.000067	
14,000	56,000	.002417	.000134	....	....	
14,250	57,000	.002533	.000116	....	....	
14,500	58,000	.002800	.000267	....	....	
14,750	59,000	.003133	.000333	....	....	
15,000	60,000	.003867	.000734	.001217	.001150	
15,500	62,000	.005083	.001216	....	....	
16,000	64,000	.006383	.001300	....	....	
16,500	66,000	.008300	.001917	....	....	
17,000	68,000	.009833	.001533	....	....	
17,500	70,000	.011833	.002000	....	....	
18,000	72,000	.013583	.001750	....	....	
18,500	74,000	.015333	.001750	....	....	
19,000	76,000	.017500	.002167	....	....	
19,500	78,000	.019500	.002000	....	....	
20,000	80,000	.021750	.002250	....	....	
20,500	82,000	.024033	.002283	....	....	
21,000	84,000	.026667	.002634	....	....	
21,500	86,000	.029667	.003000	....	....	
22,000	88,000	.033200	.003533	....	....	
22,500	90,000	.036583	.003383	....	....	
23,000	92,000	.040417	.003834	....	....	
23,500	94,000	.044500	.004083	....	....	
24,000	96,000	.050583	.006083	....	....	
24,500	98,000	.058217	.007634	....	....	
25,000	100,000	.0750	.016783	....	....	
25,500	102,000	.0950 .1167	.0200 .0217	....	....	Ultimate strength.
23,400	....	....	....	....	....	Load at time of rupture.

General summary.

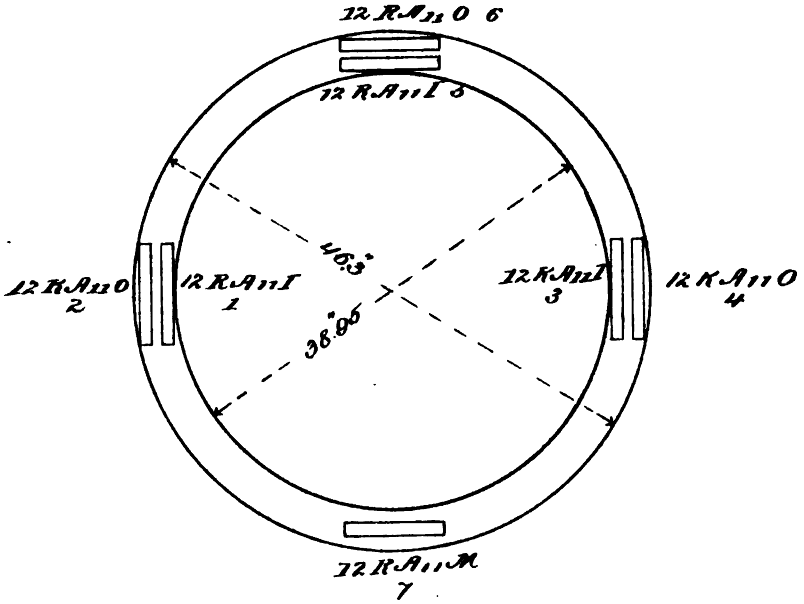
Tensile strength per square inch of original section ....pounds.. 102,000
Elastic limit per square inch of original section ....do ... 53,000
Elongation per inch after rupture ....inch.. 0.1383
Elongation per inch under strain at elastic limit ....do.... .002100
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section 36.4
Position of rupture .... 1″ from middle of stem
Character of broken surface............................ fine granular, with dull center
Elongation of inch sections .... ″.09, ″.18 (″.25 fractured section), ″.12, ″.10, ″.09.

12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop A11 (rejected)



No. 577.

Marks, $^{12\,\mathrm{R}\,\mathrm{A}_{\mathrm{II}}\,\mathrm{I}}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000283	.000166	0.	....	
3, 750	15, 000	.000433	.000150	0.	....	
5, 000	20, 000	.000600	.000167	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
10, 000	40, 000	.001283	.000183	0.	....	
10, 250	41, 000	.001300	.000017	....	....	
10, 500	42, 000	.001333	.000033	....	....	
10, 750	43, 000	.001350	.000017	....	....	
11, 000	44, 000	.001367	.000017	....	....	
11, 250	45, 000	.001400	.000033	0.	....	
11, 500	46, 000	.001450	.000050	....	....	
11, 750	47, 000	.001467	.000017	....	....	
12, 000	48, 000	.001517	.000050	....	....	
12, 250	49, 000	.001550	.000033	....	....	
12, 500	50, 000	.001617	.000067	0.	....	
12, 750	51, 000	.001033	.000016	....	....	
13, 000	52, 000	.001650	.000017	....	....	
13, 250	53, 000	.001667	.000017	....	....	
13, 500	54, 000	.001717	.000050	....	....	
13, 750	55, 000	.001767	.000050	0.	....	
14, 000	56, 000	.001800	.000033	....	....	
14, 250	57, 000	.001833	.000033	....	....	
14, 500	58, 000	.001883	.000050	....	....	
14, 750	59, 000	.001933	.000050	....	....	Elastic limit.
15, 000	60, 000	.002050	.000117	.000100	.000100	
15, 250	61, 000	.002383	.000333	....	....	
15, 500	62, 000	.002550	.000167	....	....	
15, 750	63, 000	.002883	.000333	....	....	
16, 000	64, 000	.003867	.000984	....	....	
16, 500	66, 000	.004983	.001116	....	....	
17, 000	68, 000	.006917	.001934	....	....	
17, 500	70, 000	.008850	.001933	....	....	
18, 000	72, 000	.010167	.001317	....	....	
18, 500	74, 000	.011917	.001750	....	....	
19, 000	76, 000	.013833	.001916	....	....	
19, 500	78, 000	.015417	.001584	....	....	
20, 000	80, 000	.017217	.001800	....	....	
20, 500	82, 000	.019233	.002016	....	....	
21, 000	84, 000	.021500	.002267	....	....	
21, 500	86, 000	.023833	.002333	....	....	
22, 000	88, 000	.026050	.002217	....	....	
22, 500	90, 000	.028500	.002450	....	....	
23, 000	92, 000	.031250	.002750	....	....	
23, 500	94, 000	.034750	.003500	....	....	
24, 000	96, 000	.038333	.003583	....	....	
24, 500	98, 000	.042500	.004167	....	....	
25, 000	100, 000	.047500	.005000	....	....	
25, 500	102, 000	.054170	.006670	....	....	
26, 000	104, 000	.063333	.009163	....	....	
26, 500	106, 000	0800	.016667	....	....	
26, 760	107, 040	.1100	.0300	....	....	Tensile strength.
24, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8432
Hardness		23.17
Tensile strength per square inch of original section	pounds	107, 040
Elastic limit per square inch of original section	do	59, 000
Elongation per inch after rupture	inch	0.1350
Elongation per inch under strain at elastic limit	do	.001933
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.25 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.16, ″.25, ″.11, ″.10, ″.10, ″.09

No. 578.

Marks, $^{12\,\mathrm{R}\,\mathrm{A}_{11}\,\mathrm{O}}_{\quad 2}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000200	.000200	0.	....	
2,500	10,000	.000433	.000133	0.	....	
3,750	15,000	.000600	.000167	0.	....	
5,000	20,000	.000800	.000200	0.	....	
6,250	25,000	.000950	.000150	0.	....	
7,500	30,000	.001100	.000150	0.	....	
8,750	35,000	.001267	.000167	0.	....	
10,000	40,000	.001417	.000150	0.	....	
10,250	41,000	.001417	0.	....	....	
10,500	42,000	.001450	.000033	....	....	
10,750	43,000	.001500	.000050	....	....	
11,000	44,000	.001567	.000067	....	....	
11,250	45,000	.001583	.000016	0.	....	
11,500	46,000	.001617	.000034	....	....	
11,750	47,000	.001650	.000033	....	....	
12,000	48,000	.001683	.000033	....	....	
12,250	49,000	.001700	.000017	....	....	
12,500	50,000	.001717	.000017	0.	....	
12,750	51,000	.001767	.000050	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001833	.000033	....	....	
13,500	54,000	.001867	.000034	....	....	
13,750	55,000	.001933	.000066	0.	....	
14,000	56,000	.001950	.000017	....	....	
14,250	57,000	.001983	.000033	....	....	
14,500	58,000	.002033	.000050	....	....	
14,750	59,000	.002067	.000034	....	....	
15,000	60,000	.002117	.000050	.000050	.000050	
15,250	61,000	.002133	.000016	....	....	Elastic limit.
15,500	62,000	.002233	.000100	....	....	
15,750	63,000	.002367	.000134	....	....	
16,000	64,000	.002533	.000166	....	....	
16,250	65,000	.002867	.000334	....	....	
16,500	66,000	.003350	.000483	....	....	
17,000	68,000	.004667	.001317	....	....	
17,500	70,000	.006667	.002000	....	....	
18,000	72,000	.008167	.001500	....	....	
18,500	74,000	.009867	.001700	....	....	
19,000	76,000	.011500	.001633	....	....	
19,500	78,000	.013333	.001833	....	....	
20,000	80,000	.015000	.001667	....	....	
20,500	82,000	.017000	.002000	....	....	
21,000	84,000	.018683	.001683	....	....	
21,500	86,000	.021000	.002317	....	....	
22,000	88,000	.023167	.002167	....	....	
22,500	90,000	.025667	.002500	....	....	
23,000	92,000	.028250	.002583	....	....	
23,500	94,000	.030967	.002717	....	....	
24,000	96,000	.034033	.003066	....	....	
24,500	98,000	.037667	.003634	....	....	
25,000	100,000	.041800	.004133	....	....	
25,500	102,000	.046500	.004700	....	....	
26,000	104,000	.053083	.006583	....	....	
26,500	106,000	.061000	.007917	....	....	
27,000	108,000	.0767	.0157	....	....	
27,320	109,280	.1083	.0316	....	....	Tensile strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	109,280
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1450
Elongation per inch under strain at elastic limit	do....	.002133
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		38.4
Position of rupture		″.80 from middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.10, ″.13, ″.30*, ″.15, ″.10, ″.09

No. 579.

Marks, 12 R $\frac{\text{A II}}{3}$ I
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000283	.000200	0.	....	
3,750	15,000	.000400	.000117	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001183	.000150	0.	....	
10,250	41,000	.001217	.000034	....	....	
10,500	42,000	.001250	.000033	....	....	
10,750	43,000	.001283	.000033	....	....	
11,000	44,000	.001317	.000034	....	....	
11,250	45,000	.001350	.000033	0.	....	
11,500	46,000	.001383	.000033	....	....	
11,750	47,000	.001417	.000034	....	....	
12,000	48,000	.001467	.000050	....	....	
12,250	49,000	.001483	.000016	....	....	
12,500	50,000	.001533	.000050	0.	....	
12,750	51,000	.001550	.000017	....	....	
13,000	52,000	.001633	.000083	....	....	
13,250	53,000	.001650	.000017	....	....	
13,500	54,000	.001683	.000033	....	....	
13,750	55,000	.001700	.000017	0.	....	
14,000	56,000	.001733	.000033	....	....	
14,250	57,000	.001767	.000034	....	....	
14,500	58,000	.001800	.000033	....	....	
14,750	59,000	.001900	.000100	....	....	
15,000	60,000	.001967	.000067	.000050	.000050	Elastic limit.
15,250	61,000	.002133	.000166	....	....	
15,500	62,000	.002467	.000334	....	....	
15,750	63,000	.002800	.000333	....	....	
16,000	64,000	.003267	.000467	....	....	
16,500	66,000	.005167	.001900	....	....	
17,000	68,000	.006750	.001583	....	....	
17,500	70,000	.008417	.001667	....	....	
18,000	72,000	.010050	.001633	....	....	
18,500	74,000	.011833	.001783	....	....	
19,000	76,000	.013533	.001700	....	....	
19,500	78,000	.015333	.001800	....	....	
20,000	80,000	.017350	.002017	....	....	
20,500	82,000	.019500	.002150	....	....	
21,000	84,000	.021417	.001917	....	....	
21,500	86,000	.023500	.002083	....	....	
22,000	88,000	.026000	.002500	....	....	
22,500	90,000	.028750	.002750	....	....	
23,000	92,000	.031600	.002850	....	....	
23,500	94,000	.034500	.002900	....	....	
24,000	96,000	.038333	.003833	....	....	
24,500	98,000	.042700	.004367	....	....	
25,000	100,000	.047333	.004633	....	....	
25,500	102,000	.054533	.007200	....	....	
26,000	104,000	.062000	.007467	....	....	
26,500	106,000	.0800	.0180	....	....	
26,800	107,200	.1117	.0317	....	....	Tensile strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section........pounds.. 107,200
Elastic limit per square inch of original section........do.... 60,000
Elongation per inch after rupture........inch.. 0.1500
Elongation per inch under strain at elastic limit........do.... .001967
Reduction in diameter at point of rupture........do.... .124
Reduction in area after rupture, per centum of original section........ 30.2
Position of rupture........ 2" from neck
Character of broken surface........fine granular, dull center
Elongation of inch sections........ ".12, ".32", ".16, ".11, ".10, ".09

No. 580.

Marks, 12 R $\underset{4}{\text{Au}}$ O
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000417	.000150	0.	....	
5,000	20,000	.000583	.000166	0.	....	
6,250	25,000	.000717	.000134	0.	....	
7,500	30,000	.000900	.000183	0.	....	
8,750	35,000	.001050	.000150	0.	....	
10,000	40,000	.001217	.000167	0.	....	
10,250	41,000	.001250	.000033	....	....	
10,500	42,000	.001283	.000033	....	....	
10,750	43,000	.001317	.000034	....	....	
11,000	44,000	.001333	.000016	....	....	
11,250	45,000	.001350	.000017	0.	....	
11,500	46,000	.001400	.000050	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001483	.000016	....	....	
12,500	50,000	.001533	.000050	.0	....	
12,750	51,000	.001550	.000017	....	....	
13,000	52,000	.001600	.000050	....	....	
13,250	53,000	.001633	.000033	....	....	
13,500	54,000	.001700	.000067	....	....	
13,750	55,000	.001717	.000017	0.	....	
14,000	56,000	.001750	.000033	....	....	
14,250	57,000	.001800	.000050	....	....	
14,500	58,000	.001833	.000033	....	....	
14,750	59,000	.001883	.000050	....	....	Elastic limit.
15,000	60,000	.002117	.000234	.000183	.000183	
15,250	61,000	.002317	.000200	....	....	
15,500	62,000	.002483	.000166	....	....	
15,750	63,000	.003133	.000650	....	....	
16,000	64,000	.003717	.000584	....	....	
16,500	66,000	.005250	.001533	....	....	
17,000	68,000	.006967	.001717	....	....	
17,500	70,000	.008800	.001833	....	....	
18,000	72,000	.010500	.001700	....	....	
18,500	74,000	.012133	.001633	....	....	
19,000	76,000	.013917	.001784	....	....	
19,500	78,000	.015683	.001766	....	....	
20,000	80,000	.017550	.001867	....	....	
20,500	82,000	.019383	.001833	....	....	
21,000	84,000	.021500	.002117	....	....	
21,500	86,000	.023917	.002417	....	....	
22,000	88,000	.026500	.002583	....	....	
22,500	90,000	.028833	.002333	....	....	
23,000	92,000	.031833	.003000	....	....	
23,500	94,000	.035250	.003417	....	....	
24,000	96,000	.038667	.003417	....	....	
24,500	98,000	.043167	.004500	....	....	
25,000	100,000	.048167	.005000	....	....	
25,500	102,000	.055833	.007666	....	....	
26,000	104,000	.065000	.009167	....	....	
26,500	106,000	.0850	.0200	....	....	
26,780	107,120	.1167	.0317	....	....	Tensile strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107,120
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		38.4
Position of rupture		2″ from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.12, ″.31*, ″.15, ″.12, ″.11, ″.09

No. 711.

Marks, $^{12\,B\,A_{5}\,11\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000083	.000083	0.	....	
2, 500	10, 000	.000250	.000167	0.	....	
3, 750	15, 000	.000417	.000167	0.	....	
5, 000	20, 000	.000600	.000183	0.	....	
6, 250	25, 000	.000767	.000167	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
10, 000	40, 000	.001250	.000150	0.	....	
10, 250	41, 000	.001283	.000033	....	....	
10, 500	42, 000	.001333	.000050	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001400	.000033	....	....	
11, 250	45, 000	.001433	.000033	0.	....	
11, 500	46, 000	.001500	.000067	....	....	
11, 750	47, 000	.001550	.000050	....	....	
12, 000	48, 000	.001567	.000017	....	....	
12, 250	49, 000	.001600	.000033	....	....	
12, 500	50, 000	.001650	.000050	0.	....	
12, 750	51, 000	.001700	.000050	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001767	.000034	....	....	Elastic limit.
13, 500	54, 000	.001867	.000100	....	....	
13, 750	55, 000	.001950	.000083	.000133	.000133	
14, 000	56, 000	.002050	.000100	....	....	
14, 250	57, 000	.002133	.000083	....	....	
14, 500	58, 000	.002300	.000167	....	....	
14, 750	59, 000	.002417	.000117	....	....	
15, 000	60, 000	.002850	.000433	.000800	.000667	
15, 500	62, 000	.003450	.000600	....	....	
16, 000	64, 000	.004500	.001050	....	....	
16, 500	66, 000	.005833	.001333	....	....	
17, 000	68, 000	.007333	.001500	....	....	
17, 500	70, 000	.009167	.001834	....	....	
18, 000	72, 000	.010333	.001166	....	....	
18, 500	74, 000	.011967	.001634	....	....	
19, 000	76, 000	.013500	.001533	....	....	
19, 500	78, 000	.015367	.001867	....	....	
20, 000	80, 000	.017083	.001716	....	....	
20, 500	82, 000	.018717	.001634	....	....	
21, 000	84, 000	.020583	.001866	....	....	
21, 500	86, 000	.022667	.002084	....	....	
22, 000	88, 000	.025167	.002500	....	....	
22, 500	90, 000	.027333	.002166	....	....	
23, 000	92, 000	.030167	.002834	....	....	
23, 500	94, 000	.032833	.002666	....	....	
24, 000	96, 000	.035833	.003000	....	....	
24, 500	98, 000	.039250	.003417	....	....	
25, 000	100, 000	.0450	.005750	....	....	
25, 500	102, 000	.0500	.0050	....	....	
26, 000	104, 000	.0567	.0067	....	....	
26, 500	106, 000	.0683	.0116	....	....	
26, 960	107, 840	.0933	.0250	....	....	Tensile strength.
25, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107, 840
Elastic limit per square inch of original section	do....	53, 000
Elongation per inch after rupture	inch..	0. 1050
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.074
Reduction in area after rupture, per centum of original section		24. 6
Position of rupture		1″.50 from neck
Character of broken surface		granular
Elongation of inch sections		″.10, ″.22*, ″.10, ″.09, ″.07, ″.06

No. 712.

Marks, $^{12\ \text{K}\ \text{A}_{11}\ \text{O}}_{6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000050	.000050	—.000017	—.000017	
2, 500	10, 000	.000183	.000133	—.000017	0.	
3, 750	15, 000	.000367	.000184	—.000017	0.	
5, 000	20, 000	.000533	.000166	—.000017	0.	
6, 250	25, 000	.000683	.000150	—.000017	0.	
7, 500	30, 000	.000867	.000184	—.000017	0.	
8, 750	35, 000	.001033	.000166	—.000017	0.	
10, 000	40, 000	.001200	.000167	—.000017	0.	
10, 250	41, 000	.001233	.000033	....	....	
10, 500	42, 000	.001267	.000034	....	....	
10, 750	43, 000	.001300	.000033	....	....	
11, 000	44, 000	.001333	.000033	....	....	
11, 250	45, 000	.001383	.000050	—.000017	0.	
11, 500	46, 000	.001433	.000050	....	....	
11, 750	47, 000	.001467	.000034	....	....	
12, 000	48, 000	.001500	.000033	....	....	
12, 250	49, 000	.001533	.000033	....	....	
12, 500	50, 000	.001600	.000067	0.	.000017	
12, 750	51, 000	.001650	.000050	....	....	
13, 000	42, 000	.001733	.000083	....	....	
13, 250	53, 000	.001767	.000034	....	....	Elastic limit.
13, 500	54, 000	.001850	.000083	....	....	
13, 750	55, 000	.002000	.000150	.000150	.000150	
14, 000	56, 000	.002083	.000083	....	....	
14, 250	57, 000	.002200	.000117	....	....	
14, 500	58, 000	.002367	.000167	....	....	
14, 750	59, 000	.002533	.000166	....	....	
15, 000	60, 000	.003033	.000500	.000967	.000817	
15, 500	62, 000	.003883	.000850	....	....	
16, 000	64, 000	.005033	.001150	....	....	
16, 500	66, 000	.006517	.001484	....	....	
17, 000	68, 000	.008167	.001650	....	....	
17, 500	70, 000	.009817	.001650	....	....	
18, 000	72, 000	.011167	.001350	....	....	
18, 500	74, 000	.013000	.001833	....	....	
19, 000	76, 000	.014750	.001750	....	....	
19, 500	78, 000	.016300	.001550	....	....	
20, 000	80, 000	.018167	.001867	....	....	
20, 500	82, 000	.020100	.001933	....	....	
21, 000	84, 000	.022167	.002067	....	....	
21, 500	86, 000	.024183	.002016	....	....	
22, 000	88, 000	.026633	.002450	....	....	
22, 500	90, 000	.029167	.002534	....	....	
23, 000	92, 000	.031833	.002666	....	....	
23, 500	94, 000	.034917	.003084	....	....	
24, 000	96, 000	.038667	.003750	....	....	
24, 500	98, 000	.041867	.003200	....	....	
25, 000	100, 000	.048500	.006633	....	....	
25, 500	102, 000	.0567	.0082	....	....	
26, 000	104, 000	.0633	.0066	....	....	
26, 500	106, 000	.0750	.0117	....	....	
26, 810	107, 240	.0983	.0233	....	....	Tensile strength.
25, 300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds.. 107.240
Elastic limit per square inch of original section..........do 53,000
Elongation per inch after rupture..........inch .. 0.1117
Elongation per inch under strain at elastic limit..........do .... .001767
Reduction in diameter at point of rupture..........do .... .074
Reduction in area after rupture, per centum of original section.......... 24.6
Position of rupture.......... ″.80 from neck
Character of broken surface.......... granular; small eccentric dull spot
Elongation of inch sections..........″.21, ″.12, ″.10, ″.08, ″.09, ″.07

No. 713.

Marks, $^{12\,R\,Au\,M}_{\quad 7}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000050	.000050	
2,500	10,000	.000367	.000200	.000050	0.	
3,750	15,000	.000500	.000133	.000050	0.	
5,000	20,000	.000683	.000183	.000050	0.	
6,250	25,000	.000850	.000167	.000050	0.	
7,500	30,000	.001033	.000183	.000050	0.	
8,750	35,000	.001200	.000167	.000067	.000017	
10,000	40,000	.001367	.000167	.000067	0.	
10,250	41,000	.001400	.000033	....	....	
10,500	42,000	.001450	.000050	....	....	
10,750	43,000	.001483	.000033	....	....	
11,000	44,000	.001533	.000050	....	....	
11,250	45,000	.001567	.000034	.000083	.000016	
11,500	46,000	.001617	.000050	....	....	
11,750	47,000	.001650	.000033	....	....	Elastic limit.
12,000	48,000	.001767	.000117	....	....	
12,250	49,000	.001850	.000083	....	....	
12,500	50,000	.002000	.000150	.000267	.000184	
12,750	51,000	.002100	.000100	....	....	
13,000	52,000	.002350	.000250	....	....	
13,250	53,000	.002550	.000200	....	....	
13,500	54,000	.002838	.000283	....	....	
13,750	55,000	.003167	.000334	.001183	.000916	
14,000	56,000	.003683	.000516	....	....	
14,250	57,000	.004000	.000317	....	....	
14,500	58,000	.004700	.000700	....	....	
14,750	59,000	.005333	.000633	....	....	
15,000	60,000	.006067	.000734	.003783	.002600	
15,500	62,000	.007433	.001366	....	....	
16,000	64,000	.008833	.001400	....	....	
16,500	66,000	.010300	.001467	....	....	
17,000	68,000	.011667	.001367	....	....	
17,500	70,000	.013433	.001766	....	....	
18,000	72,000	.015167	.001734	....	....	
18,500	74,000	.017583	.002416	....	....	
19,000	76,000	.018833	.001250	....	....	
19,500	78,000	.020667	.001834	....	....	
20,000	80,000	.022750	.002083	....	....	
20,500	82,000	.024833	.002083	....	....	
21,000	84,000	.027250	.002417	....	....	
21,500	86,000	.029867	.002617	....	....	
22,000	88,000	.032417	.002550	....	....	
22,500	90,000	.035500	.003083	....	....	
23,000	92,000	.039183	.003683	....	....	
23,500	94,000	.043000	.003867	....	....	
24,000	96,000	.048250	.005250	....	....	
24,500	98,000	.053750	.005500	....	....	
25,000	100,000	.0617	.007950	....	....	
25,500	102,000	.0750	.0133	....	....	
25,860	103,440	.0950	.0200	....	....	Tensile strength.
24,600	....	....	....	....	....	Load at time of rupture.

General summary.

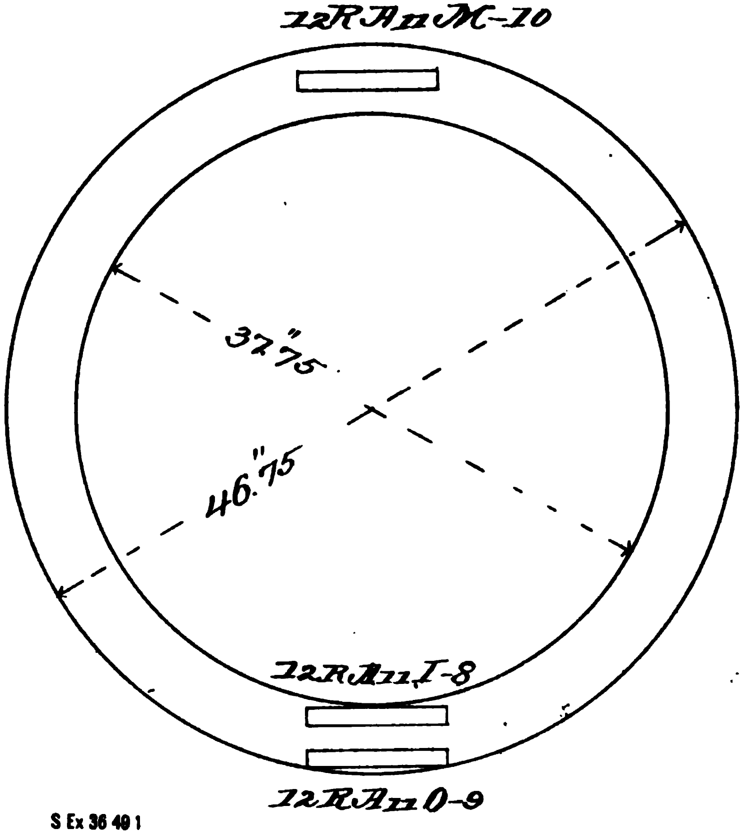
Tensile strength per square inch of original section	pounds..	103,440
Elastic limit per square inch of original section	do....	47 000
Elongation per inch after rupture	inch..	0.1117
Elongation per inch under strain at elastic limit	do...	.01650
Reduction in diameter at point of rupture	do...	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		″.70 from neck
Character of broken surface		granular; dull eccentric spot
Elongation of inch sections		″.22, ″.11, ″.10, ″.09, ″.08, ″.07

12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

(New) Hoop A11



No. 821.

Marks, $^{12\,\text{B}}\,{}^{\text{A II I}}_{8}$
Diameter, ″.563.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000317	.000184	0.	....	
3, 750	15, 000	.000450	.000133	0.	....	
5, 000	20, 000	.000617	.000167	.000033	.000033	
6, 250	25, 000	.000733	.000116	.000033	0.	
7, 500	30, 000	.000950	.000217	.000050	.000015	
8, 750	35, 000	.001117	.000167	.000050	0.	
10. 000	40, 000	.001250	.000133	.000050	0.	
10, 250	41, 000	.001283	.000033	....	....	
10, 500	42, 000	.001317	.000034	....	....	
10, 750	43, 000	.001350	.000033	....	....	Elastic limit.
11, 000	44, 000	.001450	.000100	....	....	
11, 250	45, 000	.001500	.000050	.000133	.000083	
11, 500	46, 000	.001633	.000133	....	....	
11. 750	47, 000	.001717	.000084	....	....	
12, 000	48, 000	.001900	.000183	....	....	
12, 250	49, 000	.002067	.000167	....	....	
12, 500	50, 000	.002233	.000166	.000617	.000484	
12, 750	51, 000	.002433	.000200	....	....	
13, 000	52, 000	.002583	.000150	....	....	
13, 250	53, 000	.002783	.000200	....	....	
13, 500	54, 000	.003117	.000334	....	....	
13, 750	55, 000	.003467	.000350	.001633	.001016	
14, 000	56, 000	.003967	.000500	....	....	
14, 250	57, 000	.004233	.000266	....	....	
14, 500	58, 000	.004817	.000584	....	....	
14, 750	59, 000	.005400	.000583	....	....	
15, 000	60, 000	.006300	.000900	.004150	.002517	
15, 500	62, 000	.007533	.001233	....	....	
16, 000	64, 000	.009083	.001550	....	....	
16, 500	66, 000	.010683	.001600	....	....	
17, 000	68, 000	.012633	.001950	....	....	
17, 500	70, 000	.014500	.001867	....	....	
18, 000	72, 000	.016667	.002167	....	....	
18, 500	74, 000	.018333	.001666	....	....	
19, 000	76, 000	.020333	.002000	....	....	
19, 500	78, 000	.022500	.002167	....	....	
20, 000	80, 000	.025000	.002500	....	....	
20, 500	82, 000	.027667	.002667	....	....	
21, 000	84, 000	.030500	.002833	....	....	
21, 500	86, 000	.0333	.0028	....	....	
22, 000	88, 000	.0367	.0034	....	....	
22, 500	90, 000	.0417	.0050	....	....	
23, 000	92, 000	.0500	.0083	....	....	
23, 500	94, 000	.0567	.0067	....	....	
24, 000	96, 000	.0667	.0100	....	....	
24, 500	98, 000	.0783	.0116	....	....	
24, 980	99, 920	.1133	.0350	....	....	Tensile strength.
21, 800	....	....	....	....	....	Load at time of rupture.

General saummary.

Specific gravity		7. 8505
Hardness		18. 09
Tensile strength per square inch of original section	pounds..	99, 920
Elastic limit per square inch of original section	do....	43, 000
Elongation per inch after rupture	inch..	0. 1467
Elongation per inch under strain at elastic limit	do....	.001350
Reduction in diameter at point of rupture	do....	.133
Reduction in area after rupture, per centum of original section		41. 9.
Position of rupture		1″.3 from neck
Character of broken surface		dull, silky
Elongation of inch sections		″.18, ″.30*, ″.12, ″.10, ″.09, ″.09

No. 822.

Marks, $^{12\,\mathrm{R}\,\mathrm{Au}\,\mathrm{O}}_{\quad 9}$
Diameter, ''.563.
Sectional area, .25 square inch.
Length, 6''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000233	.000150	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000550	.000150	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000833	.000133	0.	....	
8,750	35,000	.001000	.000167	0.	....	
10,000	40,000	.001167	.000167	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001250	.000017	....	....	
11,000	44,000	.001300	.000050	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	Elastic limit.
12,000	48,000	.001467	.000067	....	....	
12,250	49,000	.001567	.000100	....	....	
12,500	50,000	.001817	.000250	.000200	.000200	
12,750	51,000	.002017	.000200	....	....	
13,000	52,000	.002333	.000316	....	....	
13,250	53,000	.002733	.000400	....	....	
13,500	54,000	.003583	.000850	....	....	
13,750	55,000	.004017	.000434	.002133	.001933	
14,000	56,000	.004667	.000650	....	....	
14,250	57,000	.005033	.000366	....	....	
14,500	58,000	.005683	.000650	....	....	
14,750	59,000	.006267	.000584	....	....	
15,000	60,000	.007033	.000766	.004833	.002700	
15,500	62,000	.008267	.001234	....	....	
16,000	64,000	.010000	.001733	....	....	
16,500	66,000	.011667	.001667	....	....	
17,000	68,000	.013417	.001750	....	....	
17,500	70,000	.015200	.001783	....	....	
18,000	72,000	.017250	.002050	....	....	
18,500	74,000	.019350	.002100	....	....	
19,000	76,000	.021167	.001817	....	....	
19,500	78,000	.023583	.002416	....	....	
20,000	80,000	.026167	.002584	....	....	
20,500	82,000	.029000	.002833	....	....	
21,000	84,000	.032633	.003633	....	....	
21,500	86,000	.035733	.003100	....	....	
22,000	88,000	.039583	.003850	....	....	
22,500	90,000	.043667	.004084	....	....	
23,000	92,000	.0467	.003033	....	....	
23,500	94,000	.0533	.0066	....	....	
24,000	96,000	.0650	.0117	....	....	
24,500	98,000	.0800	.0150	....	....	
24,720	98,880	.1000	.0200	....	....	Tensile strength.
22,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	98,880
Elastic limit per square inch of original section	do....	47,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.001400
Reduction in diameter at point of rupture	do....	.133
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1'' from neck
Character of broken surface		granular, 40 per centum; silky, 60 per centum
Elongation of inch sections		''.31*, ''.16, ''.09, ''.08, ''.07, ''.09

No. 823.

Marks, $\frac{12\ \text{R Au M}}{10}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000550	.000133	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	.000017	.000017	
10,000	40,000	.001200	.000167	.000017	0.	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001317	.000084	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001367	0.	.000017	0.	
11,500	46,000	.001417	.000050	....	....	
11,750	47,000	.001467	.000050	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001567	.000067	....	....	Elastic limit.
12,500	50,000	.001650	.000083	.000117	.000100	
12,750	51,000	.001850	.000200	....	....	
13,000	52,000	.002067	.000217	....	....	
13,250	53,000	.002233	.000166	....	....	
13,500	54,000	.002583	.000350	....	....	
13,750	55,000	.003017	.000434	.001150	.001033	
14,000	56,000	.003467	.000450	....	....	
14,250	57,000	.003683	.000216	....	....	
14,500	58,000	.004050	.000367	....	....	
14,750	59,000	.004550	.000500	....	....	
15,000	60,000	.005200	.000650	.003150	.002000	
15,500	62,000	.006633	.001433	....	....	
16,000	64,000	.007833	.001200	....	....	
16,500	66,000	.009667	.001834	....	....	
17,000	68,000	.011333	.001666	....	....	
17,500	70,000	.013000	.001667	....	....	
18,000	72,000	.014500	.001500	....	....	
18,500	74,000	.016333	.001833	....	....	
19,000	76,000	.018333	.002000	....	....	
19,500	78,000	.020167	.001834	....	....	
20,000	80,000	.022333	.002166	....	....	
20,500	82,000	.024833	.002500	....	....	
21,000	84,000	.027200	.002367	....	....	
21,500	86,000	.030000	.002800	....	....	
22,000	88,000	.032667	.002667	....	....	
22,500	90,000	.035917	.003250	....	....	
23,000	92,000	.039833	.003916	....	....	
23,500	94,000	.044000	.004167	....	....	
24,000	96,000	.0467	.0027	....	....	
24,500	98,000	.0550	.0083	....	....	
25,000	100,000	.0650	.0100	....	....	
25,500	102,000	.0817	.0167	....	....	
25,640	102,560	.1083	.0266	....	....	Tensile strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

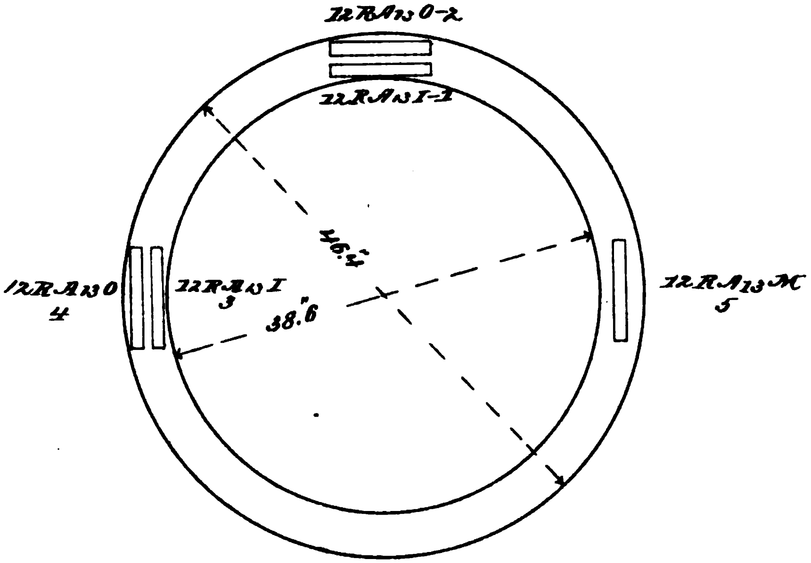
Tensile strength per square inch of original section	pounds..	102,560
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do ...	.001567
Reduction in diameter at point of rupture	do ...	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		2″.1 from neck
Character of broken surface		granular, 60 per cent.; silky, 40 per cent.
Elongation of inch sections		″.09, ″.28*, ″.15, ″.11, ″.09, ″.08

12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop A13



Specimens 12RA13 I-2 and 12RA13 O-2 were taken out before the hoop was oil-tempered and annealed.

No. 544.

Tension Test.

Marks on bar, 12 R $\underset{1}{\mathrm{A}}$ 12I
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000400	.000267	0.	....	
3, 750	15, 000	.000583	.000183	0.	....	
5, 000	20, 000	.000800	.000217	0.	....	
6, 250	25, 000	.000967	.000167	0.	....	
7, 500	30, 000	.001167	.000200	0.	....	
8, 500	34, 000	.001333	.000166	....	....	Elastic limit.
8, 750	35, 000	.001483	.000150	.000133	....	
9, 000	36, 000	.001633	.000150	....	....	
9, 250	37, 000	.001950	.000317	....	....	
9, 500	38, 000	.002800	.000850	....	....	
9, 750	39, 000	.004083	.001283	....	....	
10, 000	40, 000	.005133	.001050	.003200	.003167	
10, 250	41, 000	.005717	.000584	....	....	
10, 500	42, 000	.006633	.000916	....	....	
10, 750	43, 000	.007167	.000534	....	....	
11, 000	44, 000	.008383	.001216	....	....	
11, 250	45, 000	.009167	.000784	.006867	.003667	
11, 500	46, 000	.010083	.000916	....	....	
11, 750	47, 000	.010633	.000550	....	....	
12, 000	48, 000	.012000	.001367	....	....	
12, 250	49, 000	.012633	.000633	....	....	
12, 500	50, 000	.014033	.001400	.011333	.004466	
12, 750	51, 000	.014967	.000934	....	....	
13, 000	52, 000	.015700	.000733	....	....	
13, 250	53, 000	.016500	.000800	....	....	
13, 500	54, 000	.018333	.001833	....	....	
13, 750	55, 000	.019033	.000700	....	....	
14, 000	56, 000	.020500	.001467	....	....	
14, 250	57, 000	.021617	.001117	....	....	
14, 500	58, 000	.022867	.001250	....	....	
14, 750	59, 000	.024083	.001216	....	....	
15, 000	60, 000	.026033	.001950	....	....	
15, 500	62, 000	.028250	.002217	....	....	
16, 000	64, 000	.030317	.002067	....	....	
16, 500	66, 000	.034533	.004216	....	....	
17, 000	68, 000	.037833	.003300	....	....	
17, 500	70, 000	.042417	.004584	....	....	
18, 000	72, 000	.048250	.005833	....	....	
18, 500	74, 000	.053083	.004833	....	....	
19, 000	76, 000	.060367	.007284	....	....	
19, 500	78, 000	.0667	.006333	....	....	
20, 000	80, 000	.0850	.0183	....	....	
20, 500	82, 000	.1133	.0283	....	....	
20, 900	83, 600	.1617	.0484	....	....	Tensile strength.
19, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7. 8575
Hardness		14. 90
Tensile strength per square inch of original section	pounds..	83, 600
Elastic limit per square inch of original section	do....	34, 000
Elongation per inch after rupture	inch..	0. 1833
Elongation per inch under strain at elastic limit	do ..	.001333
Reduction in diameter at point of rupture	do...	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		″.50 from middle of stem

Character of broken surface, dull, spongy; interspersed with granular metal; cylindrical surface mottled.
Elongation of inch sections ....″.12, ″.17 (″.37 fractured section), ″.18, ″.15, ″.11

No. 545.

Tension Test.

Marks on bar, 12 R $\frac{\text{Au}}{3}$ O
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	0.	....	
3, 750	15, 000	.000433	.000200	0.	....	
5, 000	20, 000	.000633	.000200	0.	....	
6, 250	25, 000	.000833	.000200	0.	....	
7, 500	30, 000	.001033	.000200	0.	....	
7, 750	31, 000	.001100	.000067	....	....	
8, 000	32, 000	.001133	.000033	....	....	
8, 250	33, 000	.001183	.000050	....	....	
8, 500	34, 000	.001217	.000034	....	....	
8, 750	35, 000	.001267	.000050	0.	....	
9, 000	36, 000	.001300	.000033	....	....	
9, 250	37, 000	.001367	.000067	....	....	Elastic limit.
9, 500	38, 000	.001467	.000100	....	....	
9, 750	39, 000	.001600	.000133	....	....	
10, 000	40, 000	.002867	.001267	.001133	.001133	
10, 250	41, 000	.003417	.000550	....	....	
10, 500	42, 000	.004483	.001066	....	....	
10, 750	43, 000	.004967	.000484	....	....	
11, 000	44, 000	.005817	.000850	....	....	
11, 250	45, 000	.006533	.000716	.004383	.003250	
11, 500	46, 000	.007333	.000800	....	....	
11, 750	47, 000	.007967	.000634	....	....	
12, 000	48, 000	.008850	.000883	....	....	
12, 250	49, 000	.009750	.000900	....	....	
12, 500	50, 000	.010900	.001150	.008400	.004017	
12, 750	51, 000	.011483	.000583	....	....	
13, 000	52, 000	.012300	.000817	....	....	
13, 250	53, 000	.013333	.001033	....	....	
13, 500	54, 000	.014350	.001017	....	....	
13, 750	55, 000	.015300	.000950	....	....	
14, 000	56, 000	.016300	.001000	....	....	
14, 250	57, 000	.017133	.000833	....	....	
14, 500	58, 000	.018400	.001267	....	....	
14, 750	59, 000	.019333	.000933	....	....	
15, 000	60, 000	.020617	.001284	....	....	
15, 500	62, 000	.022800	.002183	....	....	
16, 000	64, 000	.025000	.002200	....	....	
16, 500	66, 000	.027750	.002750	....	....	
17, 000	68, 000	.030333	.002583	....	....	
17, 500	70, 000	.033333	.003000	....	....	
18, 000	72, 000	.037000	.003667	....	....	
18, 500	74, 000	.040800	.003800	....	....	
19, 000	76, 000	.044833	.004033	....	....	
19, 500	78, 000	.051167	.006334	....	....	
20, 000	80, 000	.059033	.007866	....	....	
20, 500	82, 000	.0700	.010967	....	....	
21, 000	84, 000	.0783	.0083	....	....	
21, 500	86, 000	.0967	.0184	....	....	
22, 000	88, 000	.1333 .1633	.0366 .0300	....	....	Tensile strength.
20, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88, 000
Elastic limit per square inch of original section	do....	37, 000
Elongation per inch after rupture	inch..	0. 2050
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section	...	33 5
Position of rupture		2″ from neck.

Character of broken surface, granular, with dull spongy spot at circumference. Cylindrical surface mottled.

Elongation of inch sections .... ″.18, ″.35°, ″.31, ″.21, ″.16, ″.12

No. 714.

Marks, $\underset{3}{12\,\text{R}\,\text{A}\,12\,\text{I}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	.000050	.000050	
2,500	10,000	.000317	.000167	.000050	0.	
3,750	15,000	.000483	.000166	.000050	0.	
5,000	20,000	.000650	.000167	.000050	0.	
6,250	25,000	.000817	.000167	.000050	0.	
7,500	30,000	.001033	.000216	.000050	0.	
8,750	35,000	.001200	.000167	.000050	0.	
10,000	40,000	.001350	.000150	.000050	0.	
10,250	41,000	.001383	.000033	....	....	
10,500	42,000	.001433	.000050	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001500	.000033	....	....	
11,250	45,000	.001533	.000033	.000067	.000017	
11,500	46,000	.001567	.000034	....	....	
11,750	47,000	.001600	.000033	....	....	
12,000	48,000	.001633	.000033	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001733	.000066	.000117	.000050	
12,750	51,000	.001800	.000067	....	....	
13,000	52,000	.001867	.000067	....	....	
13,250	53,000	.001933	.000066	....	....	
13,500	54,000	.002033	.000100	....	....	
13,750	55,000	.002100	.000067	.000233	.000116	Probable elastic limit.
14,000	56,000	.002250	.000150	....	....	
14,250	57,000	.002400	.000150	....	....	
14,500	58,000	.002617	.000217	....	....	
14,750	59,000	.002817	.000200	....	....	
15,000	60,000	.003317	.000500	.001233	.001000	
15,500	62,000	.004667	.001350	....	....	
16,000	64,000	.005517	.000850	....	....	
16,500	66,000	.008333	.001816	....	....	
17,000	68,000	.010133	.001800	....	....	
17,500	70,000	.011917	.001784	....	....	
18,000	72,000	.013833	.001916	....	....	
18,500	74,000	.015683	.001850	....	....	
19,000	76,000	.017667	.001984	....	....	
19,500	78,000	.019750	.002083	....	....	
20,000	80,000	.021917	.002167	....	....	
20,500	82,000	.024500	.002583	....	....	
21,000	84,000	.026917	.002417	....	....	
21,500	86,000	.029667	.002750	....	....	
22,000	88,000	.032750	.003083	....	....	
22,500	90,000	.036167	.003417	....	....	
23,000	92,000	.040167	.004000	....	....	
23,500	94,000	.044833	.004666	....	....	
24,000	96,000	.050667	.005834	....	....	
24,500	98,000	.0567	.006033	....	....	
25,000	100,000	.0683	.0116	....	....	
25,415	101,660	.0967	.0284	....	....	Tensile strength.
23,100	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8632
Hardness	19.81
Tensile strength per square inch of original section ... pounds	101,660
Elastic limit per square inch of original section ... do	55,000
Elongation per inch after rupture ... inch	0.1250
Elongation per inch under strain at elastic limit ... do	.002100
Reduction in diameter at point of rupture ... do	.104
Reduction in area after rupture, per centum of original section	33.5
Position of rupture	″.30 from middle of stem
Character of broken surface	granular, dull center
Elongation of inch sections	″.08, ″.14, ″.26*, ″.10, ″.10, ″.07

No. 715.

Marks, $^{12\,R\,A_{4}\,B\,O}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000550	.000150	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001033	.000166	0.	....	
10,000	40,000	.001233	.000200	0.	....	
10,250	41,000	.001250	.000017	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001450	.000050	....	....	
11,750	47,000	.001483	.000033	....	....	
12 000	48,000	.001533	.000050	....	....	
12,250	40,000	.001567	.000034	....	....	
12,500	50,000	.001017	.000050	0.	....	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
12,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001833	.000100	....	....	
18,750	55,000	.001883	.000050	.000067	.000067	Elastic limit.
14,000	56,000	.001967	.000084	....	....	
14,250	57,000	.002067	.000100	....	....	
14,500	58,000	.002167	.000100	....	....	
14,750	59,000	.002233	.000066	....	....	
15,000	60,000	.002483	.000250	.000467	.000400	
15,500	62,000	.003000	.000517	....	....	
16,000	64,000	.003700	.000700	....	....	
16,500	06,000	.005000	.001300	....	....	
17,000	68,000	.006750	.001750	....	....	
17,500	70,000	.008500	.001750	....	....	
18,000	72,000	.010167	.001667	....	....	
18,500	74,000	.011867	.001700	....	....	
19,000	76,000	.013667	.001800	....	....	
19,500	78,000	.015467	.001800	....	....	
20,000	80,000	.017833	.002366	....	....	
20,500	82,000	.019817	.001984	....	....	
21,000	84,000	.021750	.001933	....	....	
21,500	86,000	.023583	.001833	....	....	
22,000	88,000	.025917	.002334	....	....	
22,500	90,000	.028667	.002750	....	....	
23,000	92,000	.031083	.002416	....	....	
23,500	94,000	.034333	.003250	....	....	
24,000	96,000	.038333	.004000	....	....	
24,500	98,000	.043083	.004750	....	....	
25,000	100,000	.047333	.004250	....	....	
25,500	102,000	.0533	.005967	....	....	
26,000	104,000	.0617	.0084	....	....	
26,500	106,000	.0767	.0150	....	....	
26,790	107,100	.1017	.0250	....	....	Tensile strength.
24,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107,100
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		2″.1 from neck
Character of broken surface		granular, small spongy spot at the circumference
Elongation of inch sections		″.09, ″.24*, ″.16, ″.12, ″.09, ″.07

No. 716.

Marks, $^{12\ R\ A_{11}\ M}_{5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

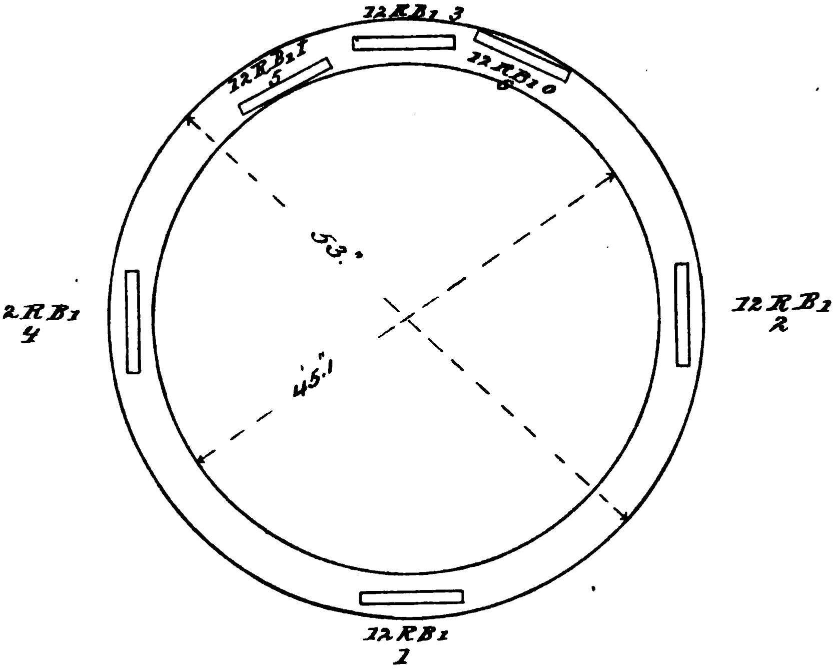
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	.000017	.000017	
2,500	10,000	.000317	.000184	.000033	.000016	
8,750	15,000	.000483	.000166	.000033	0.	
5,000	20,000	.000633	.000150	.000033	0.	
6,250	25,000	.000817	.000184	.000033	0.	
7,500	30,000	.001017	.000200	.000033	0.	
3,750	35,000	.001150	.000133	.000033	0.	
10,000	40,000	.001333	.001183	.000050	.000017	
10,250	41,000	.001350	.000017	....	....	
10,500	42,000	.001400	.000050	....	....	
10,750	43,000	.001433	.000033	....	....	
11,000	44,000	.001467	.000034	....	....	
11,250	45,000	.001500	.000033	.000050	0.	
11,500	46,000	.001550	.000050	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001650	.000017	....	....	
12,500	50,000	.001700	.000050	.000083	.000033	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001833	.000083	....	....	
13,250	53,000	.001883	.000050	....	....	Elastic limit.
13,500	54,000	.001967	.000084	....	....	
13,750	55,000	.002083	.000116	.000217	.000134	
14,000	56,000	.002217	.000134	....	....	
14,250	57,000	.002350	.000133	....	....	
14,500	58,000	.002533	.000183	....	....	
14,750	59,000	.002867	.000334	....	....	
15,000	60,000	.003517	.000650	.001400	001183	
15,500	62,000	.004750	.001233	....	....	
16,000	64,000	.006667	.001917	....	....	
16,500	66,000	.008500	.001833	....	....	
17,000	68,000	.010200	.001700	....	....	
17,500	70,000	.011750	.001550	....	....	
18,000	72,000	.013633	.001883	....	....	
18,500	74,000	.015333	.001700	....	....	
19,000	76,000	.017583	.002250	....	....	
19,500	78,000	.019583	.002000	....	....	
20,000	80,000	.021750	.002167	....	....	
20,500	82,000	.024167	.002417	....	....	
21,000	84,000	.026667	.002500	....	....	
21,500	86,000	.029367	.002700	....	....	
22,000	88,000	.032500	.003133	....	....	
22,500	90,000	.035917	.003417	....	....	
23,000	92,000	.039167	.003250	....	....	
23,500	94,000	.044167	.005000	....	....	
24,000	96,000	.050833	.006666	....	....	
24,500	98,000	.0583	.007467	....	....	
25,000	100,000	.0667	.0084	....	....	
25,500	102,000	.0883	.0216	....	....	
25,600	102,400	.1067	.0184	....	....	Tensile strength.
23,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,400
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do....	.001883
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″.1 from neck
Character of broken surface		granular, dull center
Elongation of inch sections		″.08, ″.26*, ″.18, ″.12, ″.10, ″.08

12" B. L. Rifle
Cast Iron Body
Hooped and Tubed with Steel.

Hoop B1



S Ex 36 49 1

No. 460.

Tension Test.

Marks on bar, $^{12}\mathrm{R}^{\mathrm{A}_1}_{1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000617	.000150	0.	....	
6,250	25,000	.000783	.000166	.000017	.000017	
7,500	30,000	.000917	.000134	.000017	0.	
8,750	35,000	.001083	.000166	.000033	.000016	
10,000	40,000	.001250	.000167	.000050	.000017	
10,250	41,000	.001283	.000033	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001400	.000050	....	....	
11,250	45,000	.001450	.000050	.000050	0.	
11,500	46,000	.001533	.000083	....	....	
11,750	47,000	.001567	.000034	....	....	
12,000	48,000	.001617	.000050	....	....	Elastic limit.
12,250	49,000	.001700	.000083	....	....	
12,500	50,000	.001917	.000217	.000300	.000250	
12,750	51,000	.002150	.000233	....	....	
13,000	52,000	.002533	.000383	....	....	
13,250	53,000	.002817	.000284	....	....	
13,500	54,000	.003467	.000650	....	....	
13,750	55,000	.004200	.000733	.002250	.001950	
14,000	56,000	.004700	.000500	....	....	
14,250	57,000	.005117	.000417	....	....	
14,500	58,000	.005917	.000800	....	....	
14,750	59,000	.006767	.000850	....	....	
15,000	60,000	.007667	.000900	....	....	
19,000	76,000	.022633	.014966	....	....	
19,500	78,000	.024250	.001617	....	....	
20,000	80,000	.026833	.002583	....	....	
20,500	82,000	.029550	.002717	....	....	
21,000	84,000	.032167	.002617	....	....	
21,500	86,000	.035333	.003166	....	....	
22,000	88,000	.038667	.003334	....	....	
22,500	90,000	.044000	.005333	....	....	
23,000	92,000	.048000	.004000	....	....	
23,500	94,000	.053833	.005833	....	....	
24,000	96,000	.067500	.013667	....	....	
24,500	98,000	.0783	.0108	....	....	
25,000	100,000	.1033	.0250	....	....	
25,060	100,240	.1250	.0217	....	....	Ultimate strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8543
Hardness		19.81
Tensile strength per square inch of original section	pounds	100,240
Elastic limit per square inch of original section	do	48,000
Elongation per inch after rupture	inch	0.1567
Elongation per inch under strain at elastic limit	do	.001617
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″.50 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.16 (″.31 fractured section), ″.13, ″.12, ″.11, ″.11

No. 461.

Tension Test.

Marks on bar $^{12}\,{}^{B}_{2}{}^{A_x}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000250	.000167	0.	....	
3,750	15,000	.000417	.000167	0.	....	
5,000	20,000	.000583	.000166	0.	....	
6,250	25,000	.000750	.000167	0.	....	
7,500	30,000	.000917	.000167	0.	....	
8,750	35,000	.001067	.000150	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001333	.000066	....	....	
10,750	43,000	.001350	.000017	....	....	
11,000	44,000	.001400	.000050	....	....	
11,250	45,000	.001433	.000033	.000017	.000017	
11,500	46,000	.001500	.000067	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001583	.000050	....	....	
12,250	49,000	.001617	.000034	....	....	Elastic limit.
12,500	50,000	.001700	.000083	.000117	.000100	
12,750	51,000	.001833	.000133	....	....	
13,000	52,000	.002033	.000200	....	....	
13,250	53,000	.002233	.000200	....	....	
13,500	54,000	.002633	.000400	....	....	
13,750	55,000	.002917	.000284	.001083	.000966	
14,000	56,000	.003417	.000500	....	....	
14,250	57,000	.003833	.000416	....	....	
14,500	58,000	.004650	.000817	....	....	
14,750	59,000	.005283	.000633	....	....	
15,000	60,000	.006250	.000967	.004133	.003050	
15,500	62,000	.007517	.001267	....	....	
16,000	64,000	.009200	.001683	....	....	
16,500	66,000	.010867	.001667	....	....	
17,000	68,000	.012800	.001933	....	....	
17,500	70,000	.014500	.001700	....	....	
18,000	72,000	.016500	.002000	....	....	
18,500	74,000	.018667	.002167	....	....	
19,000	76,000	.020417	.001750	....	....	
19,500	78,000	.022833	.002416	....	....	
20,000	80,000	.025333	.002500	....	....	
20,500	82,000	.028000	.002667	....	....	
21,000	84,000	.030833	.002833	....	....	
21,500	86,000	.034000	.003167	....	....	
22,000	88,000	.037333	.003333	....	....	
22,500	90,000	.041500	.004167	....	....	
23,000	92,000	.046167	.004667	....	....	
23,500	94,000	.051833	.005666	....	....	
24,000	96,000	.0617	.009867	....	....	
24,500	98,000	.0717	.0100	....	....	
25,000	100,000	.0900	.0183	....	....	
25,250	101,000	.1250	.0350	....	....	Tensile strength.
22,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	101,000
Elastic limit per square inch of original section	do	49,000
Elongation per inch after rupture	inch	0.1567
Elongation per inch under strain at elastic limit	do	.001617
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.75 from middle of stem
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.11, ″.15 (″.33 fractured section), ″.13, ″.13, ″.09

No. 462.

Tension Test.

Marks on bar, $^{12}\underset{3}{\text{R}}\,^{\text{Ax}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000767	.000150	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	.000017	.000017	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001383	.000033	....	....	
11,250	45,000	.001433	.000050	.000033	.000016	
11,500	46,000	.001483	.000050	....	....	
11,750	47,000	.001533	.000050	....	....	
12,000	48,000	.001617	.000084	....	....	
12,250	49,000	.001650	.000033	....	....	
12,500	50,000	.001717	.000067	.000150	.000117	Elastic limit.
12,750	51,000	.001850	.000133	....	....	
13,000	52,000	.002017	.000167	....	....	
13,250	53,000	.002183	.000166	....	....	
13,500	54,000	.002483	.000300	....	....	
13,750	55,000	.002800	.000317	.000967	.000817	
14,000	56,000	.003233	.000433	....	....	
14,250	57,000	.003633	.000400	....	....	
14,500	58,000	.004417	.000784	....	....	
14,750	59,000	.005000	.000583	....	....	
15,000	60,000	.005967	.000967	.003800	.002833	
15,500	62,000	.007167	.001200	....	....	
16,000	64,000	.008833	.001666	....	....	
16,500	66,000	.010467	.001634	....	....	
17,000	68,000	.012200	.001733	....	....	
17,500	70,000	.013917	.001717	....	....	
18,000	72,000	.015500	.001583	....	....	
18,500	74,000	.017683	.002183	....	....	
19,000	76,000	.019667	.001984	....	....	
19,500	78,000	.021833	.002166	....	....	
20,000	80,000	.024167	.002334	....	....	
20,500	82,000	.026667	.002500	....	....	
21,000	84,000	.029167	.002500	....	....	
21,500	86,000	.032000	.002833	....	....	
22,000	88,000	.035217	.003217	....	....	
22,500	90,000	.038833	.003616	....	....	
23,000	92,000	.043000	.004167	....	....	
23,500	94,000	.048000	.005000	....	....	
24,000	96,000	.054167	.006167	....	....	
24,500	98,000	.0633	.009133	....	....	
25,000	100,000	.0767	.0134	....	....	
25,500	102,000	.1083	.0316	....	....	
25,570	102,280	.1267	.0184	....	....	Tensile strength.
23,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	102,280
Elastic limit per square inch of original section	do	50,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain at elastic limit	do	.001717
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.75 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		(″.27 fractured section), ″.14, ″.11, ″.12, ″.12, ″.14

No. 463.

Tension Test.

Marks on bar, $^{12\,R\,A_1}_{\qquad 4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000217	.000134	0.	....	
3,750	15,000	.000400	.000183	0.	....	
5,000	20,000	.000550	.000150	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000883	.000183	0.	....	
8,750	35,000	.001050	.000167	0.	....	
10,000	40,000	.001250	.000200	.000017	.000017	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001333	.000066	....	....	
10,750	53,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	.000033	.000016	
11,500	46,000	.001500	.000067	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001650	.000017	....	....	
12,250	49,000	.001700	.000050	....	....	Elastic limit.
12,500	50,000	.001850	.000150	.000233	.000200	
12,750	51,000	.001983	.000133	....	....	
13,000	52,000	.002133	.000150	....	....	
13,250	53,000	.002333	.000200	....	....	
13,500	54,000	.002717	.000384	....	....	
13,750	55,000	.003117	.000400	.001250	.001017	
14,000	56,000	.003683	.000566	....	....	
14,250	57,000	.004183	.000500	....	....	
14,500	58,000	.005017	.000834	....	....	
14,750	59,000	.005650	.000633	....	....	
15,000	60,000	.006600	.000950	.004417	.003167	
15,500	62,000	.008000	.001400	....	....	
16,000	64,000	.009667	.001667	....	....	
16,500	66,000	.011500	.001833	....	....	
17,000	68,000	.013250	.001750	....	....	
17,500	70,000	.015167	.001917	....	....	
18,000	72,000	.017000	.001833	....	....	
18,500	74,000	.019000	.002000	....	....	
19,000	76,000	.021033	.002033	....	....	
19,500	78,000	.023500	.002467	....	....	
20,000	80,000	.026000	.002500	....	....	
20,500	82,000	.028667	.002667	....	....	
21,000	84,000	.031333	.002666	....	....	
21,500	86,000	.034833	.003500	....	....	
22,000	88,000	.038500	.003667	....	....	
22,500	90,000	.042667	.004167	....	....	
23,000	92,000	.047500	.004833	....	....	
23,500	94,000	.054167	.006667	....	....	
24,000	96,000	.062500	.008333	....	....	
24,500	98,000	.0767	.0142	....	....	
25,000	100,000	.1117	.0350	....	....	Tensile strength.
22,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8581
Hardness		20.86
Tensile strength per square inch of original section	pounds..	100,000
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1617
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.90 from middle of stem
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.12, ″.21 (″.31 fractured section), ″.13, ″.11, ″.09

No. 567.

Marks, 12 R $\frac{A_1}{5}$ I

Diameter, ″.564.

Sectional area, .25 square incl.

Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000617	.000167	0.	....	
6,250	25,000	.000767	.000150	0.	....	
7,500	30,000	.000950	.000183	0.	....	
8,750	35,000	.001117	.000167	0.	....	
10,000	40,000	.001283	.000166	0.	....	
10,250	41,000	.001317	.000034	....	....	
10,500	42,000	.001350	.000033	....	....	
10,750	43,000	.001383	.000033	....	....	
11,000	44,000	.001433	.000050	....	....	
11,250	45,000	.001467	.000034	.000017	.000017	
11,500	46,000	.001550	.000083	....	....	
11,750	47,000	.001617	.000067	....	....	
12,000	48,000	.001683	.000066	....	....	Elastic limit.
12,250	49,000	.001800	.000117	....	....	
12,500	50,000	.002033	.000233	.000317	.000300	
12,750	51,000	.002217	.000184	....	....	
13,000	52,000	.002317	.000100	....	....	
13,250	53,000	.002550	.000233	....	....	
13,500	54,000	.002967	.000417	....	....	
13,750	55,000	.003383	.000416	.001383	.001066	
14,000	56,000	.003967	.000584	....	....	
14,250	57,000	.004217	.000250	....	....	
14,500	58,000	.005000	.000783	....	....	
14,750	59,000	.006167	.001167	....	....	
15,000	60,000	.006683	.000516	.004383	.003000	
15,500	62,000	.007833	.001150	....	....	
16,000	64,000	.009300	.001467	....	....	
16,500	66,000	.011000	.001700	....	....	
17,000	68,000	.012850	.001850	....	....	
17,500	70,000	.014467	.001617	....	....	
18,000	72,000	.016333	.001866	....	....	
18,500	74,000	.018100	.001767	....	....	
19,000	76,000	.020083	.001983	....	....	
19,500	78,000	.022500	.002417	....	....	
20,000	80,000	.026000	.003500	....	....	
20,500	82,000	.027500	.001500	....	....	
21,000	84,000	.030000	.002500	....	....	
21,500	86,000	.032167	.002167	....	....	
22,000	88,000	.035750	.003583	....	....	
22,500	90,000	.039683	.003933	....	....	
23,000	92,000	.044017	.004334	....	....	
23,500	94,000	.048667	.004650	....	....	
24,000	96,000	.054833	.006166	....	....	
24,500	98,000	.0633	.008467	....	....	
25,000	100,000	.0767	.0134	....	....	
25,500	102,000	.1017	.0250	....	....	
25,570	102,280	.1200	.0183	....	....	Tensile strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,280
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.1067
Elongation per inch under strain at elastic limit	do....	.001683
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		53.5
Position of rupture		1″.3 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.17, ″.23*, ″.13, ″.15, ″.19, ″.13

No. 568.

Marks, $^{12}\,B\,\frac{A_2}{6}\,O$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000300	.000183	0.		
3,750	15,000	.000460	.000167	0.		
5,000	20,000	.000617	.000150	0.		
6,250	25,000	.000783	.000166	0.		
7,500	30,000	.000950	.000167	0.		
8,750	35,000	.001117	.000167	0.		
10,000	40,000	.001300	.000183	0.		
10,250	41,000	.001333	.000033			
10,500	42,000	.001367	.000034			
10,750	43,000	.001417	.000050			
11,000	44,000	.001467	.000050			
11,250	45,000	.001517	.000050	.000050	.000050	
11,500	46,000	.001583	.000066			
11,750	47,000	.001633	.000050			
12,000	48,000	.001717	.000084			
12,250	49,000	.001783	.000066			Elastic limit.
12,500	50,000	.002017	.000234	.000317	.000267	
12,750	51,000	.002133	.000116			
13,000	52,000	.002300	.000167			
13,250	53,000	.002533	.000233			
13,500	54,000	.002967	.000434			
13,750	55,000	.003333	.000366	.001383	.001066	
14,000	56,000	.003933	.000600			
14,250	57,000	.004383	.000450			
14,500	58,000	.005167	.000784			
14,750	59,000	.005683	.000516			
15,000	60,000	.006533	.000850	.004467	.003084	
15,500	62,000	.008000	.001467			
16,000	64,000	.010000	.002000			
16,500	66,000	.011517	.001517			
17,000	68,000	.013167	.001650			
17,500	70,000	.015000	.001833			
18,000	72,000	.016700	.001700			
18,500	74,000	.019000	.002300			
19,000	76,000	.021333	.002333			
19,500	78,000	.023333	.002000			
20,000	80,000	.025683	.002350			
20,500	82,000	.028250	.002567			
21,000	84,000	.030667	.002417			
21,500	86,000	.033917	.003250			
22,000	88,000	.037500	.003583			
22,500	90,000	.041667	.004167			
23,000	92,000	.046333	.004666			
23,500	94,000	.051167	.004834			
24,000	96,000	.059017	.007850			
24,500	98,000	.0683	.009283			
25,000	100,000	.0883	.0200			
25,100	100,640	.1117	.0234			Tensile strength.
22,900						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,640
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001783
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.60 from middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.09, ″.11, ″.13, ″.30*, ″.13, ″.09

No. 664.

Marks, $^{12\,R\,A_x\,I}_{7}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000117	.000117	0.	....	
2, 500	10, 000	.000317	.000200	0.	....	
3, 750	15, 000	.000483	.000166	0.	....	
5, 000	20, 000	.000617	.000134	0.	....	
6, 250	25, 000	.000800	.000183	0.	....	
7, 500	30, 000	.000967	.000167	0.	....	
8, 740	35, 000	.001133	.000166	.000017	.000017	
10, 000	40, 000	.001300	.000167	.000017	0.	
10, 250	41, 000	.001317	.000017	....	....	
10, 500	42, 000	.001333	.000016	....	....	
10, 750	43, 000	.001367	.000034	....	....	
11, 000	44, 000	.001483	.000066	....	....	
11, 250	45, 000	.001467	.000034	.000033	.000016	
11, 500	46, 000	.001517	.000050	....	....	
11, 750	47, 000	.001533	.000016	....	....	
12, 000	48, 000	.001567	.000034	....	....	
12, 250	49, 000	.001633	.000066	....	....	
12, 500	50, 000	.001683	.000050	·000067	.000034	
12, 750	51, 000	.001717	.000034	....	....	
13, 000	52, 000	.001767	.000050	....	....	Elastic limit.
13, 250	53, 000	.001850	.000083	....	....	
13, 500	54, 000	.001933	.000083	....	....	
13, 750	55, 000	.002033	.000100	.000183	.000116	
14, 000	56, 000	.002167	.000134	....	....	
14, 250	57, 000	.002250	.000083	....	....	
14, 500	58, 000	.002383	.000133	....	....	
14, 750	59, 000	.002533	.000150	....	....	
15, 000	60, 000	.002967	.000434	.000867	.000684	
15, 500	62, 000	.003483	.000516	....	....	
16, 000	64, 000	.004583	.001100	....	....	
16, 500	66, 000	.005700	.001117	....	....	
17, 000	68, 000	.007333	.001633	....	....	
17, 500	70, 000	.008967	.001634	....	....	
18, 000	72, 000	.010517	.001550	....	....	
18, 500	74, 000	.012300	.001783	....	....	
19, 000	76, 000	.013867	.001567	....	....	
19, 500	78, 000	.015667	.001800	....	....	
20, 000	80, 000	.017500	.001833	....	....	
20, 500	82, 000	.019183	.001683	....	....	
21, 000	84, 000	.021633	.002450	....	....	
21, 500	86, 000	.023750	.002117	....	....	
22, 000	88, 000	.026000	.002250	....	....	
22, 500	90, 000	.028417	.002417	....	....	
23, 000	92, 000	.031217	.002800	....	....	
23, 500	94, 000	.034533	.003316	....	....	
24, 000	96, 000	.037833	.002800	....	....	
24, 500	98, 000	.041583	.004250	....	....	
25, 000	100, 000	.045550	.003967	....	....	
25, 500	102, 000	.0517	.006150	....	....	
26, 000	104, 000	.0600	.0083	....	....	
26, 500	106, 000	.0700	.0100	....	....	
26, 980	107, 920	.0983	.0283	....	....	Tensile strength.
24, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107, 920
Elastic limit per square inch of original section	do....	52, 000
Elongation per inch after rupture	inch..	0. 1267
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do ...	.084
Reduction in area after rupture, per centum of original section		27. 6
Position of rupture		1″.4 from neck
Character of broken surface		granular, with dull center
Elongation of inch sections		″.14, ″26*, ″.11, ″.09, ″.08, ″.08

No. 665.

Marks, $^{12\,\mathrm{B\,A_2\,O}}_{\quad 8}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000200	.000200	0.	....	
2, 500	10, 000	.000383	.000183	0.	....	
3, 750	15, 000	.000550	.000167	0.	....	
5, 000	20, 000	.000683	.000133	0.	....	
6, 250	25, 000	.000850	.000167	0.	....	
7, 500	30, 000	.001017	.000167	0.	....	
8, 750	35, 000	.001183	.000166	0.	....	
10, 000	40, 000	.001350	.000167	.000017	.000017	
10, 250	41, 000	.001383	.000033	....	....	
10, 500	42, 000	.001417	.000034	....	....	
10, 750	43, 000	.001433	.000016	....	....	
11, 000	44, 000	.001500	.000067	....	....	
11, 250	45, 000	.001533	.000033	.000033	.000016	
11, 500	46, 000	.001567	.000034	....	....	
11, 750	47, 000	.001617	.000050	....	....	
12, 000	48, 000	.001650	.000033	....	....	
12, 250	49, 000	.001683	.000033	....	....	
12, 500	50, 000	.001750	.000067	.000083	.000050	
12, 750	51, 000	.001800	.000050	....	....	
13, 000	52, 000	.001867	.000067	....	....	
13, 250	53, 000	.001917	.000050	....	....	Elastic limit.
13, 500	54, 000	.002017	.000100	....	....	
13, 750	55, 000	.002083	.000066	.000300	.000217	
14, 000	56, 000	.002283	.000200	....	....	
14, 250	57, 000	.002383	.000100	....	....	
14, 500	58, 000	.002517	.000134	....	....	
14, 750	59, 000	.002683	.000166	....	....	
15, 000	60, 000	.003017	.000334	.000933	.000633	
15, 500	62, 000	.003633	.000616	....	....	
16, 000	64, 000	.004750	.001117	....	....	
16, 500	66, 000	.006433	.001683	....	....	
17, 000	68, 000	.008217	.001784	....	....	
17, 500	70, 000	.009950	.001733	....	....	
18, 000	72, 000	.011450	.001500	....	....	
18, 500	74, 000	.013200	.001750	....	....	
19, 000	76, 000	.014950	.001750	....	....	
19, 500	78, 000	.016667	.001717	....	....	
20, 000	80, 000	.018617	.001950	....	....	
20, 500	82, 000	.020833	.002216	....	....	
21, 000	84, 000	.022750	.001917	....	....	
21, 500	86, 000	.025333	.002583	....	....	
22, 000	88, 000	.027700	.002367	....	....	
22, 500	90, 000	.030333	.002633	....	....	
23, 000	92, 000	.033300	.002967	....	....	
23, 500	94, 000	.036617	.003317	....	....	
24, 000	96, 000	.040333	.003716	....	....	
24, 500	98, 000	.045000	.004667	....	....	
25, 000	100, 000	.0517	.0067	....	....	
25, 500	102, 000	.0583	.0066	....	....	
26, 000	104, 000	.0700	.0117	....	....	
26, 500	106, 000	.0967 .1083	.0267 .0116	....	....	Tensile strength.
24, 400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	106, 000
Elastic limit per square inch of original section	do ...	53, 000
Elongation per inch after rupture	inch..	0. 1317
Elongation per inch under strain at elastic limit	do....	.001917
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30. 6
Position of rupture		″.85 from middle of stem
Character of broken surface		granular, dull center
Elongation of inch sections		″.09, ″.14, ″.23*, ″.13, ″.11, ″.09

No. 666.

Marks, $^{12}\text{R}\,\underset{9}{\text{A}_{1}}\,\text{M}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000317	.000167	0.	....	
3,750	15,000	.000483	.000166	0.	....	
5,000	20,000	.000633	.000150	0.	....	
6,250	25,000	.000800	.000167	0.	....	
7,500	30,000	.000967	.000167	0.	....	
8,750	35,000	.001133	.000166	0.	....	
10,000	40,000	.001300	.000167	.000017	.000017	
10,250	41,000	.001317	.000017	....	....	
10,500	42,000	.001350	.000033	....	....	
10,750	43,000	.001383	.000033	....	....	
11,000	44,000	.001433	.000050	....	....	
11,250	45,000	.001467	.000034	....	....	
11,500	46,000	.001517	.000050	....	....	
11,750	47,000	.001567	.000050	....	....	
12,000	48,000	.001617	.000050	....	....	
12,250	49,000	.001650	.000038	....	....	
12,500	50,000	.001700	.000050	.000067	.000050	Elastic limit.
12,750	51,000	.001767	.000067	....	....	
13,000	52,000	.001850	.000083	....	....	
13,250	53,000	.001917	.000067	....	....	
13,500	54,000	.002050	.000133	....	....	
13,750	55,000	.002183	.000133	.000350	.000283	
14,000	56,000	.002450	.000267	....	....	
14,250	57,000	.002567	.000117	....	....	
14,500	58,000	.002817	.000250	....	....	
14,750	59,000	.003033	.000216	....	....	
15,000	60,000	.003500	.000467	.001400	.001050	
15,500	62,000	.004583	.001083	....	....	
16,000	64,000	.005583	.001000	....	....	
16,500	66,000	.007083	.001500	....	....	
17,000	68,000	.008883	.001800	....	....	
17,500	70,000	.010400	.001517	....	....	
18,000	72,000	.012000	.001600	....	....	
18,500	74,000	.013783	.001783	....	....	
19,000	76,000	.015667	.001884	....	....	
19,500	78,000	.017550	.001883	....	....	
20,000	80,000	.019500	.001950	....	....	
20,500	82,000	.021367	.001867	....	....	
21,000	84,000	.023767	.002400	....	....	
21,500	86,000	.026167	.002400	....	....	
22,000	88,000	.028867	.001700	....	....	
22,500	90,000	.031267	.002400	....	....	
23,000	92,000	.034750	.003483	....	....	
23,500	94,000	.038333	.003583	....	....	
24,000	96,000	.042267	.003934	....	....	
24,500	98,000	.0500	.007733	....	....	
25,000	100,000	.0550	.0050	....	....	
25,500	102,000	.0683	.0133	....	....	
26,000	104,000	.0733	.0050	....	....	
26,500	106,000	.0917	.0184	....	....	
26,540	106,160	.1200	.0283	....	....	Tensile strength.
24,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength, per square inch of original section	pounds..	106,160
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1550
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.10 from middle of stem
Character of broken surface		granular, dull center
Elongation of inch sections		″.11, ″.14, ″.25*, ″.19, ″.13, ″.11

No. 667.

Marks, $^{12\,\mathrm{B}\,\mathrm{A}_1\,\mathrm{M}}_{10}$
Diameter, ."564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive elongation set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000617	.000184	0.	....	
6,250	25,000	.000800	.000183	0.	....	
7,500	30,000	.000983	.000183	0.	....	
8,750	35,000	.001117	.000134	0.	....	
10,000	40,000	.001300	.000183	0.	....	
10,250	41,000	.001317	.000017	....	....	
10,500	42,000	.001350	.000033	....	....	
10,750	43,000	.001383	.000033	....	....	
11,000	44,000	.001433	.000050	....	....	
11,250	45,000	.001467	.000034	0.	....	
11,500	46,000	.001533	.000066	....	....	
11,750	47,000	.001583	.000050	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001683	.000050	....	....	Elastic limit.
12,500	50,000	.001783	.000100	.000083	.000083	
12,750	51,000	.001867	.000084	....	....	
13,000	52,000	.002000	.000133	....	....	
13,250	53,000	.002133	.000133	....	....	
13,500	54,000	002283	.000150	....	....	
13,750	55,000	.002433	.000150	.000483	.000400	
14,000	56,000	.002833	.000400	....	....	
14,250	57,000	.003017	.000184	....	....	
14,500	58,000	.003383	.000366	....	....	
14,750	59,000	.003750	.000367	....	....	
15,000	60,000	.004483	.000733	.002200	.001717	
15,500	62,000	.005500	.001017	....	....	
16,000	64,000	.006833	.001333	....	....	
16,500	66,000	.008333	.001500	....	....	
17,000	68,000	.009717	.001384	....	....	
17,500	70,000	.011833	.002116	....	....	
18,000	72,000	.013417	.001584	....	....	
18,500	74,000	.015250	.001833	....	....	
19,000	76,000	.016950	.001700	....	....	
19,500	78,000	.019017	.002067	....	....	
20,000	80,000	.020833	.001816	....	....	
20,500	82,000	.023083	.002250	....	....	
21,000	84,000	.025383	.002300	....	....	
21,500	86,000	.027850	.002467	....	....	
22,000	88,000	.030717	.002867	....	....	
22,500	90,000	.033700	.002983	....	....	
23,000	92,000	.037183	.003483	....	....	
23,500	94,000	.041383	.004200	....	....	
24,000	96,000	.045833	.004450	....	....	
24,500	98,000	.051667	.005834	....	....	
25,000	100,000	.059383	.007716	....	....	
25,500	102,000	.0700	.010617	....	....	
26,000	104,000	.0950	.0250	....	....	
26,400	105,600	.1150	.0200	....	....	Tensile strength.
23,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	105,600
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001683
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		".4 from middle of stem
Character of broken surface		granular, with dull center
Elongation of inch sections		".10, ".12, ".15, ".26, ".13, ".10

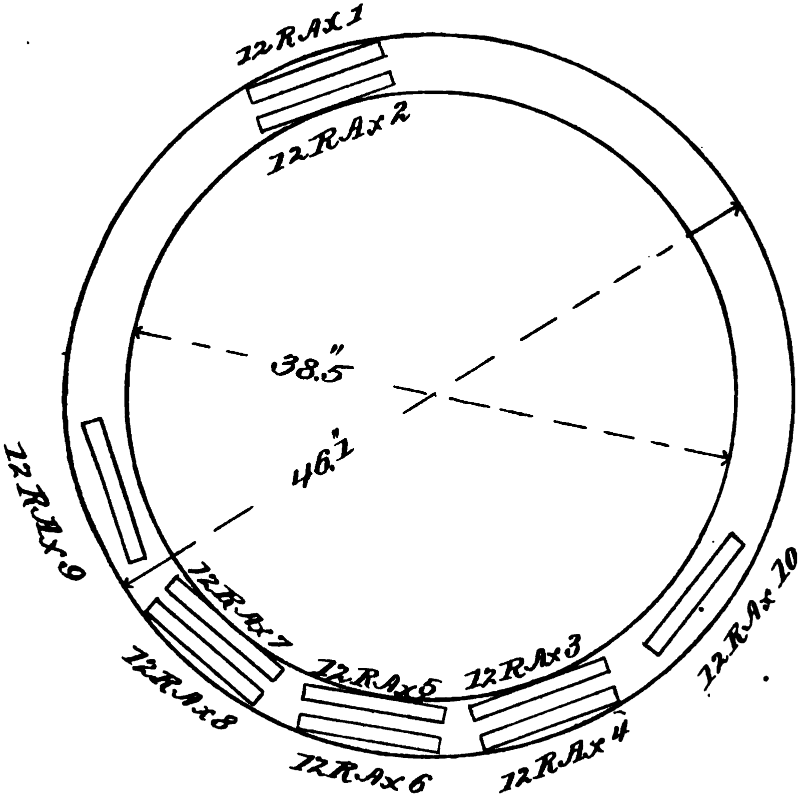
12" B. L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop Ax

Experimental Section.



S Ex 36 49 1

No. 476.

Tension Test.

Marks on bar $^{12}\underset{1}{R}\,B_1$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	—.000017	—.000017	
2,500	10,000	.000200	.000133	—.000017	0.	
3,750	15,000	.000333	.000133	—.000017	0.	
5,000	20,000	.000500	.000167	—.000017	0.	
6,250	25,000	.000650	.000150	—.000017	0.	
7,500	30,000	.000833	.000183	—.000017	0.	
8,750	35,000	.001000	.000167	—.000017	0.	
10,000	40,000	.001167	.000167	—.000017	0.	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001317	.000050	....	....	
11,250	45,000	.001350	.000033	—.000017	0.	
11,500	46,000	.001400	.000050	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001483	.000050	....	....	
12,250	49,000	.001517	.000034	....	....	
12,500	50,000	.001567	.000050	+.000017	.000034	
12,750	51,000	.001617	.000050	....	....	
13,000	52,000	.001683	.000066	....	....	
13,250	53,000	.001767	.000084	....	....	
13,500	54,000	.001867	.000100	....	....	Elastic limit.
13,750	55,000	.001967	.000100	.000200	.000183	
14,000	56,000	.002100	.000133	....	....	
14,250	57,000	.002233	.000133	....	....	
14,500	58,000	.002383	.000150	....	....	
14,720	59,000	.002550	.000167	....	....	
15,000	60,000	.002850	.000300	.000850	.000650	
15,500	62,000	.003533	.000683	....	....	
16,000	64,000	.004333	.000800	....	....	
16,500	66,000	.005550	.001217	....	....	
17,000	68,000	.006800	.001250	....	....	
17,500	70,000	.008333	.001533	....	....	
18,000	72,000	.009833	.001500	....	....	
18,500	74,000	.011350	.001517	....	....	
19,000	76,000	.012867	.001517	....	....	
19,500	78,000	.014667	.001800	....	....	
20,000	80,000	.016367	.001700	....	....	
20,500	82,000	.018167	.001800	....	....	
21,000	84,000	.019833	.001666	....	....	
21,500	86,000	.022117	.002284	....	....	
22,000	88,000	.024200	.002083	....	....	
22,500	90,000	.026667	.002467	....	....	
23,000	92,000	.029167	.002500	....	....	
23,500	94,000	.032000	.002833	....	....	
24,000	96,000	.035000	.003000	....	....	
24,500	98,000	.038333	.003333	....	....	
25,000	100,000	.042217	.003884	....	....	
25,500	102,000	.047167	.004950	....	....	
26,000	104,000	.052667	.005500	....	....	
26,500	106,000	.060000	.007333	....	....	
27,000	108,000	.0767	.0167	....	....	
27,320	109,280	.1083	.0316	....	....	Ultimate strength.
25,300	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8568
Hardness	22.64
Tensile strength per square inch of original section .... pounds..	109,280
Elastic limit per square inch of original section .... do....	54,000
Elongation per inch after rupture .... inch..	0.1217
Elongation per inch under strain at elastic limit .... do....	.001867
Reduction in diameter at point of rupture .... do....	.094
Reduction in area after rupture, per centum of original section	30.6
Position of rupture	2″ from neck
Character of broken surface	fine granular with dull center
Elongation of inch sections	″.09 (″.25 fractured section), ″.15, ″.10, ″.17, ″.07

No. 477.

Tension Test.

Marks on bar, $^{12}\frac{\text{R}}{2}\text{B}_1$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000467	.000200	0.		
5,000	20,000	.000600	.000133	0.		
6,250	25,000	.000750	.000150	0.		
7,500	30,000	.000917	.000167	0.		
8,750	35,000	.001083	.000166	.000017	.000017	
10,000	40,000	.001267	.000184	.000017	.0.	
10,250	41,000	.001283	.000016			
10,500	42,000	.001333	.000050			
10,750	43,000	.001367	.000034			
11,000	44,000	.001400	.000033			
11,250	45,000	.001433	.000033	.000033	.000016	
11,500	46,000	.001500	.000067			
11,750	47,000	.001533	.000033			
12,000	48,000	.001583	.000050			
12,250	49,000	.001650	.000067			
12,500	50,000	.001717	.000067	.000117	.000084	
12,750	51,000	.001800	.000083			Elastic limit.
13,000	52,000	.002050	.000250			
13,250	53,000	.002233	.000183			
13,500	54,000	.002567	.000334			
13,750	55,000	.003183	.000616	.001317	.001200	
14,000	56,000	.003567	.000384			
14,250	57,000	.003983	.000416			
14,500	58,000	.004783	.000800			
14,750	59,000	.005367	.000584			
15,000	60,000	.006483	.001116	.004250	.003933	
15,500	62,000	.007550	.001067			
16,000	64,000	.009300	.001750			
16,500	66,000	.010850	.001550			
17,000	68,000	.012667	.001817			
17,500	70,000	.014333	.001666			
18,000	72,000	.016167	.001834			
18,500	74,000	.017917	.001750			
19,000	76,000	.019833	.001916			
19,500	78,000	.022183	.002350			
20,000	80,000	.024333	.002150			
20,500	82,000	.026833	.002500			
21,000	84,000	.029667	.002834			
21,500	86,000	.032500	.002833			
22,000	88,000	.035667	.003167			
22,500	90,000	.039167	.003500			
23,000	92,000	.043500	.004333			
23,500	94,000	.048750	.005250			
24,000	96,000	.055167	.006417			
24,500	98,000	.064000	.008833			
25,000	100,000	.0800	.0160			
25,290	101,160	.1050	.0250			Ultimate strength.
22,600						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	101,160
Elastic limit per square inch of original section	do	51,000
Elongation per inch after rupture	inch	0.1483
Elongation per inch under strain at elastic limit	do	.001800
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1.40 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		16″ (.″32 fractured section), ″.13, ″.11, ″.10, ″.07

No. 478.

Tension Test.

Marks on bar, $^{12}\overset{R}{_{3}}{}^{B_1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000083	.000083	0.	....	
2, 500	10, 000	.000250	.000167	0.	....	
3, 750	15, 000	.000417	.000167	0.	....	
5, 000	20, 000	.000583	.000166	0.	....	
6, 250	25, 000	.000733	.000150	0.	....	
7, 500	30, 000	.000900	.000167	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001267	.000200	.000017	.000017	
10, 250	41, 000	.001283	.000016	....	....	
10, 500	42, 000	.001317	.000034	....	....	
10, 750	43, 000	.001350	.000033	....	....	
11, 000	44, 000	.001400	.000050	....	....	
11, 250	45, 000	.001433	.000033	.000017	0.	
11, 500	46, 000	.001483	.000050	....	....	
11, 750	47, 000	.001533	.000050	....	....	
12, 000	48, 000	.001567	.000034	....	....	
12, 250	48, 000	.001617	.000030	....	....	
12, 500	50, 000	.001700	.000083	.000067	.000050	
12, 750	51, 000	.001733	.000033	....	....	
13, 000	52, 000	.001783	000050	....	....	
13, 250	53, 000	.001817	.000034	....	....	
13, 500	54, 000	.001917	.000100	....	....	
13, 750	55, 000	.001983	.000066	.000217	.000150	Elastic limit.
14, 000	56, 000	.002133	.000150	....	....	
14, 250	57, 000	.002233	.000100	....	....	
14, 500	58, 000	.002417	.000184	....	....	
14, 750	59, 000	.002583	.000166	....	....	
15, 000	60, 000	.002933	.000350	.000917	.000700	
15, 500	62, 000	.003533	.000600	....	....	
16, 000	64, 000	.005000	.001467	....	....	
16, 500	66, 000	.006167	.001167	....	....	
17, 000	68, 000	.007667	.001500	....	....	
17, 500	70, 000	.009250	.001583	....	....	
18, 000	72, 000	.010800	.001550	....	....	
18, 500	74, 000	.012533	.001733	....	....	
19, 000	76, 000	.014083	.001550	....	....	
19, 500	78, 000	.015833	.001750	....	....	
20, 000	80, 000	.017533	.001700	....	....	
20, 500	82, 000	.019333	.001800	....	....	
21, 000	84, 000	.021500	.002167	....	....	
21, 500	86, 000	.023500	.002000	....	....	
22, 000	88, 000	.025833	.002333	....	....	
22, 500	90, 000	.028200	.002367	....	....	
23, 000	92, 000	.030833	.002633	....	....	
23, 500	94, 000	.032200	.001367	....	....	
24, 000	96, 000	.036917	.004717	....	....	
24, 500	98, 000	.040833	.003916	....	....	
25, 000	100, 000	.046083	.005250	....	....	
25, 500	102, 000	.051000	.004917	....	....	
26, 000	104, 000	.058333	.007333	....	....	
26, 500	106, 000	.0700	.011667	....	....	
27, 000	108, 000	.0900	.0200	....	....	
27, 050	108, 200	.1067	.0167	....	....	Ultimate strength.
25, 000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds.. 108, 200
Elastic limit per square inch of original section .... do.... 55, 000
Elongation per inch after rupture .... inch.. 0. 1233
Elongation per inch under strain at elastic limit .... do.... .001983
Reduction in diameter at point of rupture .... do.... .094
Reduction in area after rupture, per centum of original section 30. 6
Position of rupture .... ″.50 from middle of stem
Character of broken surface .... fine granular, with dull center
Elongation of inch sections .... ″.08, ″.10 (″.26 fractured section), ″.12, ″.10 ″.08

No. 479.

Tension Test.

Marks, $\frac{12\,R\,B_1}{4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000750	.000150	0.	....	
7,500	30,000	.000917	.000167	0.	....	
8,750	35,000	.001083	.000166	0.	....	
10,000	40,000	.001250	.000167	0.	....	
10,250	41,000	.001283	.000033	....	....	
10,500	42,000	.001333	.000150	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001433	.000066	....	....	
11,250	45,000	.001467	.000034	.000050	.000050	
11,500	46,000	.001583	.000116	....	....	
11,750	47,000	.001617	.000084	....	....	
12,000	48,000	.001667	.000050	....	....	Elastic limit.
12,250	49,000	.002083	.000416	....	....	
12,500	50,000	.003300	.001217	.001600	.001550	
12,750	51,000	.003633	.000333	....	....	
13,000	52,000	.004300	.000667	....	....	
13,250	53,000	.004833	.000533	....	....	
13,500	54,000	.005417	.000584	....	....	
13,750	55,000	.006333	.000916	.004183	.002583	
14,000	56,000	.006917	.000584	....	....	
14,250	57,000	.007367	.000450	....	....	
14,500	58,000	.008350	.000983	....	....	
14,750	59,000	.009000	.000650	....	....	
15,000	60,000	.009833	.000833	.007550	.003367	
15,500	62,000	.011167	.001334	....	....	
16,000	64,000	.013000	.001833	....	....	
16,500	66,000	.014683	.001683	....	....	
17,000	68,000	.016433	.001750	....	....	
17,500	70,000	.018300	.001867	....	....	
18,000	72,000	.020383	.002083	....	....	
18,500	74,000	.022583	.002200	....	....	
19,000	76,000	.024833	.002250	....	....	
19,500	78,000	.027750	.002917	....	....	
20,000	80,000	.030000	.002250	....	....	
20,500	82,000	.033217	.003217	....	....	
21,000	84,000	.035917	.002700	....	....	
21,500	86,000	.039500	.003583	....	....	
22,000	88,000	.043867	.004367	....	....	
22,500	90,000	.049050	.005183	....	....	
23,000	92,000	055333	.006283	....	....	
23,500	94,000	.063000	.007667	....	....	
24,000	96,000	.0800	.0170	....	....	
24,500	98,000	.1050	.0250	....	....	
24,520	98,080	.1200	.0150	....	....	Ultimate strength.
22,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	98,080
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.1483
Elongation per inch under strain at elastic limit	do....	.001667
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.8 from middle of stem
Character of broken surface		dull, spongy, slighty granular
Elongation of inch sections		″.12, ″.16 (″.31 fractured section), ″.11, ″.11, ″.08

No. 546.

Marks, $^{12}\frac{\text{R}}{5}{}^{\text{B}_1\text{ I}}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000300	.000167	0.	....	
3, 750	15, 000	.000450	.000150	0.	....	
5, 000	20, 000	.000667	.000217	0.	....	
6, 250	25, 000	.000817	.000150	0.	....	
7, 500	30, 000	.001050	.000233	0.	....	
8, 750	35, 000	.001217	.000167	0.	....	
10, 000	40, 000	.001383	.000166	0.	....	
10, 250	41, 000	.001400	.000017	....	....	
10, 500	42, 000	.001450	.000050	....	....	
10, 750	43, 000	.001483	.000033	....	....	
11, 000	44, 000	.001533	.000050	....	....	
11, 250	45, 000	.001583	.000050	0.	....	
11, 500	46, 000	.001617	.000034	....	....	
11, 750	47, 000	.001650	.000033	....	....	
12, 000	48, 000	.001683	.000033	....	....	
12, 250	49, 000	.001717	.000034	....	....	
12, 500	50, 000	.001750	.000033	0.	....	
12, 750	51, 000	.001783	.000033	....	....	
13, 000	52, 000	.001833	.000050	....	....	
13, 250	53, 000	.001867	.000034	....	....	
13, 500	54, 000	.001900	.000033	....	....	
13, 750	55, 000	.001950	.000050	0.	....	
14, 000	56, 000	.001983	.000033	....	....	
14, 250	57, 000	.002017	.000034	....	....	
14, 500	58, 000	.002050	.000033	....	....	
14, 750	59, 000	.002083	.000033	....	....	
15, 000	60, 000	.002117	.000034	0.	....	
15, 250	61, 000	.002183	.000066	....	....	
15, 500	62, 000	.002267	.000084	....	....	
15, 750	63, 000	.002300	.000033	....	....	
16, 000	64, 000	.002350	.000050	....	....	Elastic limit.
16, 250	65, 000	.002450	.000100	.000050	.000050	
16, 500	66, 000	.002583	.000133	....	....	
16, 750	67, 000	.002700	.000117	....	....	
17, 000	68, 000	.002883	.000183	....	....	
17, 250	69, 000	.003250	.000367	....	....	
17, 500	70, 000	.003517	.000267	.000833	.000783	
18, 000	72, 000	.004250	.000733	....	....	
18, 500	74, 000	.005467	.001217	....	....	
19, 000	76, 000	.006833	.001366	....	....	
19, 500	78, 000	.008500	.001667	....	....	
20, 000	80, 000	.010083	.001583	....	....	
20, 500	82, 000	.012017	.001934	....	....	
21, 000	84, 000	.013700	.001683	....	....	
21, 500	86, 000	.015467	.001767	....	....	
22, 000	88, 000	.017367	.001900	....	....	
22, 500	90, 000	.019500	.002133	....	....	
23, 000	92, 000	.021133	.001633	....	....	
23, 500	94, 000	.023283	.002150	....	....	
24, 000	96, 000	.025767	.002484	....	....	
24, 500	98, 000	.028167	.002400	....	....	
25, 000	100, 000	.030667	.002500	....	....	
25, 500	102, 000	.033867	.003200	....	....	
26, 000	104, 000	.037333	.003466	....	....	
26, 500	106, 000	.040717	.003384	....	....	
27, 000	108, 000	.045467	.004750	....	....	
27, 500	110, 000	.051033	.005566	....	....	
28, 000	112, 000	.0617	.010667	....	....	
28, 500	114, 000	.0733	.0116	....	....	
28, 650	114, 600	.0900	.0167	....	....	Tensile strength.
26, 700	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	114, 600
Elastic limit per square inch of original section	do....	64, 000
Elongation per inch after rupture	inch..	0. 1017
Elongation per inch under strain at elastic limit	do....	.002850
Reduction in diameter at point of rupture	do....	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		″.75 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.24*, ″.11, ″.08, ″.06, ″.06, ″.06

No. 547.

Marks, $\frac{12\,\mathrm{R\,B_1\,O}}{6}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

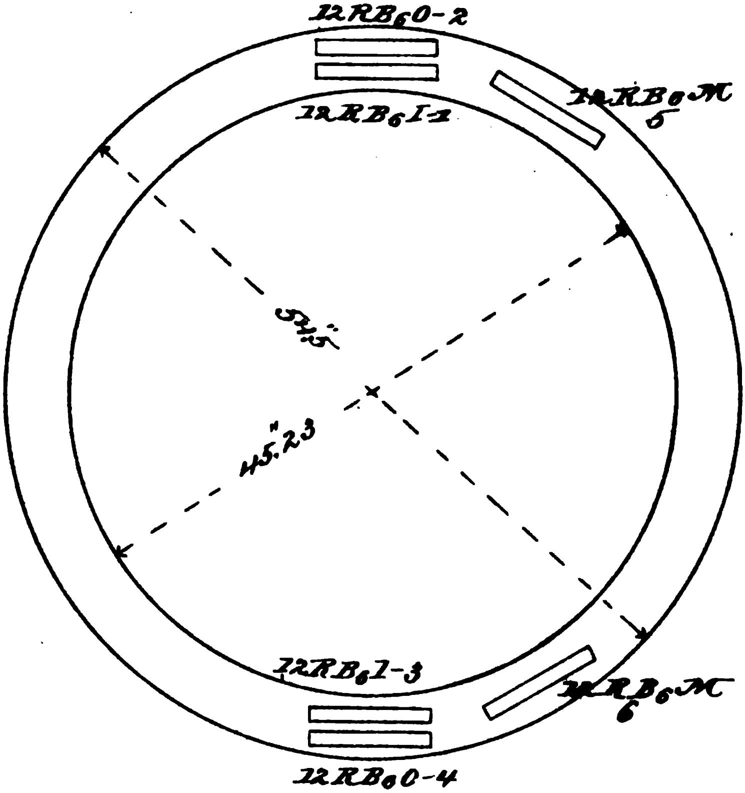
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000400	.000200	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000767	.000200	0.	....	
7,500	30,000	.000950	.000183	0.	....	
8,750	35,000	.001133	.000183	0.	....	
10,000	40,000	.001350	.000217	0.	....	
10,250	41,000	.001383	.000033	....	....	
10,500	42,000	.001433	.000050	....	....	
10,750	43,000	.001467	.000034	....	....	
11,000	44,000	.001517	.000050	....	....	
11,250	45,000	.001550	.000033	0.	....	
11,500	46,000	.001617	.000067	....	....	
11,750	47,000	.001650	.000033	....	....	
12,000	48,000	.001667	.000017	....	....	
12,250	49,000	.001700	.000033	....	....	
12,500	50,000	.001783	.000083	0.	....	
12,750	51,000	.001800	.000017	....	....	
13,000	52,000	.001850	.000050	....	....	
13,250	53,000	.001883	.000033	....	....	
13,500	54,000	.001950	.000067	....	....	Elastic limit.
13,750	55,000	.002033	.000083	.000050	.000050	
14,000	56,000	.002183	.000150	....	....	
14,250	57,000	.002367	.000184	....	....	
14,500	58,000	.002700	.000333	....	....	
14,750	59,000	.002967	.000267	....	....	
15,000	60,000	.003750	.000783	.001300	.001250	
15,250	61,000	.004333	.000583	....	....	
15,500	62,000	.005200	.000867	....	....	
15,750	63,000	.005700	.000500	....	....	
16,000	64,000	.006700	.001000	....	....	
16,250	65,000	.007500	.000800	....	....	
16,500	66,000	.008583	.001033	....	....	
16,750	67,000	.009217	.000684	....	....	
17,000	68,000	.010083	.000866	....	....	
17,250	69,000	.011083	.001000	....	....	
17,500	70,000	.012133	.001050	....	....	
18,000	72,000	.014167	.002034	....	....	
18,500	74,000	.015783	.001616	....	....	
19,000	76,000	.017800	.002017	....	....	
19,500	78,000	.019800	.002000	....	....	
20,000	80,000	.022000	.002200	....	....	
20,500	82,000	.024467	.002467	....	....	
21,000	84,000	.027000	.002533	....	....	
21,500	86,000	.029633	.002633	....	....	
22,000	88,000	.032833	.003200	....	....	
22,500	90,000	.036300	.003467	....	....	
23,000	92,000	.040083	.003783	....	....	
23,500	94,000	.045167	.005084	....	....	
24,000	96,000	.050333	.005166	....	....	
24,500	98,000	.059500	.009167	....	....	
25,000	100,000	.0767	.0172	....	....	
25,500	102,000	.1017	.0250	....	....	Tensile strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,000
Elastic limit per square inch of origiual section	do ..	54,000
Elongation per inch after rupture	inch..	0.1430
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1".6 from neck
Character of broken surface		dull spongy, granular at circumference
Elongation of inch sections		".14, ".34, ."12, "11, ".08, ".08

12" B. L. Rifle
Cast Iron Body
Hooped and Tubed with Steel.

Hoop B6



S Ex 36 49 1

No. 534.

Tension Test.

Marks on bar, $^{12}\,\mathrm{R}^{\mathrm{B.\,I}}_{1}$

Diameter, ".564.

Sectional area, .25 square inch.

Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000317	.000184	0.	....	
3,750	15,000	.000467	.000150	0.	....	
5,000	20,000	.000633	.000166	.000017	.000017	
6,250	25,000	.000800	.000167	.000033	.000016	
7,500	30,000	.000950	.000150	.000038	0.	
8,750	35,000	.001133	.000183	.000050	.000017	
10,000	40,000	.001300	.000167	.000050	0.	
10,250	41,000	.001300	0.	....	....	
10,500	42,000	.001350	.000050	....	....	
10,750	43,000	.001367	.000017	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001450	.000050	.000050	0.	
11,500	46,000	.001467	.000017	....	....	
11,750	47,000	.001533	.000066	....	....	
12,000	48,000	.001567	.000034	....	....	
12,250	49,000	.001583	.000016	....	....	
12,500	50,000	.001617	.000034	.000050	0.	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001700	.000050	....	....	
13,250	53,000	.001717	.000017	....	....	
13,500	54,000	.001783	.000066	....	....	
13,750	55,000	.001800	.000017	.000067	.000017	
14,000	56,000	.001850	.000050	....	....	
14,250	57,000	.001883	.000033	....	....	
14,500	58,000	.001933	.000050	....	....	
14,750	59,000	.001983	.000050	....	....	Elastic limit.
15,000	60,000	.002117	.000134	.000217	.000150	
15,250	61,000	.002583	.000466	....	....	
15,500	62,000	.002883	.000300	....	....	
15,750	63,000	.003350	.000467	....	....	
16,000	64,000	.004050	.000700	....	....	
16,500	66,000	.005283	.001233	....	....	
17,000	68,000	.007333	.002050	....	....	
17,500	70,000	.009000	.001667	....	....	
18,000	72,000	.010800	.001800	....	....	
18,500	74,000	.011517	.000717	....	....	
19,000	76,000	.013200	.001683	....	....	
19,500	78,000	.014917	.001717	....	....	
20,000	80,000	.017250	.002333	....	....	
20,500	82,000	.018217	.000967	....	....	
21,000	84,000	.020167	.001950	....	....	
21,500	86,000	.022250	.002083	....	....	
22,000	88,000	.024150	.001900	....	....	
22,500	90,000	.026717	.002567	....	....	
23,000	92,000	.029200	.002483	....	....	
23,500	94,000	.032183	.002983	....	....	
24,000	96,000	.035200	.003017	....	....	
24,500	98,000	.038333	.003133	....	....	
25,000	100,000	.042450	.004117	....	....	
25,500	102,000	.048167	.005717	....	....	
26,000	104,000	.054167	.006000	....	....	
26,500	106,000	.063750	.009583	....	....	
27,000	108,000	.0783	.014550	....	....	
27,390	109,560	.1233	.0450	....	....	Ultimate strength.
23,800	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8481
Hardness		23.70
Tensile strength per square inch of original section	pounds..	109,560
Elastic limit per square inch of original section	do....	59,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do....	.001983
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		2" from neck
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch section		".11 (".33 fractured section), ".15, ".12, ".11, ".10

No. 547.

Marks, ^{12}R B$_1$O$_6$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000200	.000100	0.	....	
3, 750	15, 000	.000400	.000200	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000767	.000200	0.	....	
7, 500	30, 000	.000950	.000183	0.	....	
8, 750	35, 000	.001133	.000183	0.	....	
10, 000	40, 000	.001350	.000217	0.	....	
10, 250	41, 000	.001383	.000033	....	....	
10, 500	42, 000	.001433	.000050	....	....	
10, 750	43, 000	.001467	.000034	....	....	
11, 000	44, 000	.001517	.000050	....	....	
11, 250	45, 000	.001550	.000033	0.	....	
11, 500	46, 000	.001617	.000067	....	....	
11, 750	47, 000	.001650	.000033	....	....	
12, 000	48, 000	.001667	.000017	....	....	
12, 250	49, 000	.001700	.000033	....	....	
12, 500	50, 000	.001783	.000083	0.	....	
12, 750	51, 000	.001800	.000017	....	....	
13, 000	52, 000	.001850	.000050	....	....	
13, 250	53, 000	.001883	.000033	....	....	
13, 500	54, 000	.001950	.000067	....	....	Elastic
13, 750	55, 000	.002033	.000083	.000050	.000050	
14, 000	56, 000	.002183	.000150	....	....	
14, 250	57, 000	.002367	.000184	....	....	
14, 500	58, 000	.002700	.000333	....	....	
14, 750	59, 000	.002967	.000267	....	....	
15, 000	60, 000	.003750	.000783	.001300	.001250	
15, 250	61, 000	.004333	.000583	....	....	
15, 500	62, 000	.005200	.000867	....	....	
15, 750	63, 000	.005700	.000500	....	....	
16, 000	64, 000	.006700	.001000	....	....	
16, 250	65, 000	.007500	.000800	....	....	
16, 500	66, 000	.008533	.001033	....	....	
16, 750	67, 000	.009217	.000684	....	....	
17, 000	68, 000	.010083	.000866	....	....	
17, 250	69, 000	.011083	.001000	....	....	
17, 500	70, 000	.012133	.001050	....	....	
18, 000	72, 000	.014167	.002034	....	....	
18, 500	74, 000	.015783	.001616	....	....	
19, 000	76, 000	.017800	.002017	....	....	
19, 500	78, 000	.019800	.002000	....	....	
20, 000	80, 000	.022000	.002200	....	....	
20, 500	82, 000	.024467	.002467	....	....	
21, 000	84, 000	.027000	.002533	....	....	
21, 500	86, 000	.029633	.002633	....	....	
22, 000	88, 000	.032833	.003200	....	....	
22, 500	90, 000	.036300	.003467	....	....	
23, 000	92, 000	.040083	.003783	....	....	
23, 500	94, 000	.045167	.005084	....	....	
24, 000	96, 000	.050333	.005166	....	....	
24, 500	98, 000	.059500	.009167	....	....	
25, 000	100, 000	.0767	.0172	....	....	
25, 500	102, 000	.1017	.0250	....	....	Tensile
22, 400	....	....	....	....	....	Load a

General summary.

Tensile strength per square inch of original section ....
Elastic limit per square inch of origiual section..............................
Elongation per inch after rupture..............................
Elongation per inch under strain at elastic limit..............................
Reduction in diameter at point of rupture..............................
Reduction in area after rupture, per centum of original section..............................
Position of rupture..............................
Character of broken surface.............................. dull. spongy, granul
Elongation of inch sections.............................. ″.14, ″.

No. 536.

Tension Test.

Marks on bar, $^{12\,\mathrm{R\,B_1\,I}}_{3}$

Diameter, ″.564.

Sectional area, .25 square inch.

Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000133	0.	....	
2,500	10,000	.000283	.000150	0.	....	
3,750	15,000	.000450	.000167	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000933	.000200	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001300	.000017	....	....	
10,750	43,000	.001317	.000017	....	....	
11,000	44,000	.001367	.000050	....	....	
11,250	45,000	.001400	.000033	.000017	.000017	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001483	.000016	....	....	
12,000	48,000	.001550	.000067	....	....	
12,250	49,000	.001567	.000017	....	....	
12,500	50,000	.001600	.000033	.000017	0.	
12,750	51,000	.001617	.000017	....	....	
13,000	52,000	.001650	.000033	....	....	
13,250	53,000	.001683	.000033	....	....	
13,500	54,000	.001717	.000034	....	....	
13,750	55,000	.001750	.000033	.000017	0.	
14,000	56,000	.001817	.000067	....	....	
14,250	57,000	.001867	.000050	....	....	
14,500	58,000	.001900	.000033	....	....	Elastic limit.
14,750	59,000	.002067	.000167	....	....	
15,000	60,000	.002717	.000650	.000700	.000683	
15,250	61,000	.003383	.000666	....	....	
15,500	62,000	.003717	.000334	....	....	
15,750	63,000	.004333	.000616	....	....	
16,000	64,000	.005033	.000700	....	....	
16,500	66,000	.005800	.000767	....	....	
17,000	68,000	.008200	.002400	....	....	
17,500	70,000	.009833	.001633	....	....	
18,000	72,000	.011417	.001584	....	....	
18,500	74,000	.013150	.001733	....	....	
19,000	76,000	.014500	.001350	....	....	
19,500	78,000	.016300	.001800	....	....	
20,000	80,000	.018083	.001783	....	....	
20,500	82,000	.020000	.001917	....	....	
21,000	84,000	.022083	.002083	....	....	
21,500	86,000	.024033	.001950	....	....	
22,000	88,000	.026550	.002517	....	....	
22,500	90,000	.029000	.002450	....	....	
23,000	92,000	.031667	.002667	....	....	
23,500	94,000	.035000	.003333	....	....	
24,000	96,000	.038417	.003417	....	....	
24,500	98,000	.042200	.003783	....	....	
25,000	100,000	.047000	.004800	....	....	
25,500	102,000	.053200	.006200	....	....	
26,000	104,000	.062667	.009467	....	....	
26,500	106,000	.0733	.010633	....	....	
27,000	108,000	.1050	.0217	....	....	
27,050	108,200	.1250	.0200	....	....	Ultimate strength.
23,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	108,200
Elastic limit per square inch of original section	do	58,000
Elongation per inch after rupture	inch	0.1550
Elongation per inch under strain at elastic limit	do	.001900
Reduction in diameter at point of rupture	do	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.75 from middle of stem
Character of broken surface		silky, interspersed with fine granulation
Elongation of inch sections		″.10, ″.11, ″.12 (″.33 fractured section), ″.16, ″.11

No. 537.

Tension Test.

Marks on bar, $^{12}\underset{4}{\text{R B}}{}^{6a}$
Diameter, ″.564.
Sectional area, ″.25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.		
2,500	10,000	.000317	.000184	0.		
3,750	15,000	.000483	.000166	0.		
5,000	20,000	.000633	.000150	.000017	.000017	
6,250	25,000	.000800	.000167	.000017	0.	
7,500	30,000	.000967	.000167	.000033	.000016	
8,750	35,000	.001117	.000150	.000033	0.	
10,000	40,000	.001283	.000166	.000033	0.	
10,250	41,000	.001300	.000017			
10,500	42,000	.001333	.000033			
10,750	43,000	.001350	.000017			
11,000	44,000	.001383	.000033			
11,250	45,000	.001433	.000050	.000033	0.	
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	48,000	.001567	.000034			
12,500	50,000	.001033	.000066	.000033	0.	
12,750	51,000	.001633	0.			
13,000	52,000	.001650	.000017			
13.250	53,000	.001683	.000033			
13,500	54,000	.001717	.000034			
13,750	55,000	.001750	.000033	.000050	.000017	
14,000	56,000	.001783	.000033			
14,250	57,000	.001833	.000050			
14,500	58,000	.001867	.000034			
14,750	59,000	.001900	.000033			
15,000	60,000	.001950	.000050	.000100	.000050	Elastic limit.
15,250	61,000	.002083	.000133			
15,500	62,000	.002533	.000450			
15,750	63,000	.002967	.000434			
16,000	64,000	.003667	.000700			
16,500	66,000	.005250	.001583			
17,000	68,000	.006833	.001583			
17,500	70,000	.008333	.001500			
18,000	72,000	.010033	.001700			
18,500	74,000	.011750	.001717			
19,000	76,000	.013333	.001583			
19,500	78,000	.014833	.001500			
20,000	80,000	.016833	.002000			
20,500	82,000	.018583	.001750			
21,000	84,000	.020533	.001950			
21,500	86,000	.022500	.001967			
22,000	88,000	.024533	.002033			
22,500	90,000	.027250	.002717			
23,000	92,000	.029883	.002633			
23,500	94,000	.032500	.002617			
24,000	96,000	.036167	.003667			
24,500	98,000	.039967	.003800			
25,000	100,000	.044000	.004033			
25,500	102,000	.049167	.005167			
26,000	104,000	.057417	.008250			
26,500	106,000	.0750	.017583			
27,000	108,000	.0900	.0150			
27,160	108,640	.1117	.0217			Ultimate strength.
23,800						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	108,640
Elastic limit per square inch of original section	do....	60,000
Elongation per inch after rupture	inch..	0.1533
Elongation per inch under strain at elastic limit	do...	.001950
Reduction in diameter at point of rupture	do...	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from middle of stem
Character of broken surface		silky, interspersed with fine granulations
Elongation of inch sections		″.10, ″.17 (″.33 fractured section), ″.13, ″.11, ″.08

No. 585.

Marks, $^{12\text{ R B, M}}_{\quad 5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load
1,250	5,000	.000183	.000183	.000017	.000017	
2,500	10,000	.000300	.000167	.000033	.000016	
3,750	15,000	.000467	.000167	.000033	0.	
5,000	20,000	.000633	.000166	.000033	0.	
6,250	25,000	.000800	.000167	.000033	0.	
7,500	30,000	.001000	.000200	.000033	0.	
8,750	35,000	.001183	.000183	.000033	0.	
10,000	40,000	.001300	.000167	.000033	0.	
10,250	41,000	.001317	.000017	....	....	
10,500	42,000	.001383	.000066	....	....	
10,750	43,000	.001400	.000017	....	....	
11,000	44,000	.001433	.000033	....	....	
11,250	45,000	.001467	.000034	.000033	0.	
11,500	46,000	.001517	.000050	....	....	
11,750	47,000	.001550	.000033	....	....	
12,000	48,000	.001600	.000050	....	....	
12,250	49,000	.001617	.000017	....	....	
12,500	50,000	.001650	.000033	.000050	.000017	
12,750	51,000	.001667	.000017	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001750	.000050	....	....	
13,500	54,000	.001783	.000033	....	....	
13,750	55,000	.001800	.000017	.000050	0.	
14,000	56,000	.001867	.000067	....	....	
14,250	57,000	.001883	.000016	....	....	
14,500	58,000	.001967	.000084	....	....	
14,750	59,000	.002000	.000033	....	....	
15,000	60,000	.002050	.000050	.000117	.000067	
15,500	62,000	.002133	.000083	....	....	Elastic limit.
16,000	64,000	.002467	.000334	....	....	
16,500	66,000	.002967	.000500	....	....	
17,000	68,000	.003567	.000600	....	....	
17,500	70,000	.004750	.001183	....	....	
18,000	72,000	.006333	.001583	....	....	
18,500	74,000	.007833	.001500	....	....	
19,000	76,000	.009233	.001400	....	....	
19,500	78,000	.010833	.001600	....	....	
20,000	80,000	.012267	.001434	....	....	
20,500	82,000	.013750	.001483	....	....	
21,000	84,000	.015383	.001633	....	....	
21,500	86,000	.020767	.005384	....	....	
22,000	88,000	.022750	.001983	....	....	
22,500	90,000	.025000	.002250	....	....	
23,000	92,000	.027200	.002200	....	....	
23,500	94,000	.029550	.002350	....	....	
24,000	96,000	.032333	.002783	....	....	
24,500	98,000	.035300	.002967	....	....	
25,000	100,000	.038833	.003583	....	....	
25,500	102,000	.042833	.004000	....	....	
26,000	104,000	.046833	.004000	....	....	
26,500	106,000	.0533	.006467	....	....	
27,000	108,000	.0617	.0084	....	....	
27,500	110,000	.0733	.0116	....	....	
28,000	112,000	.1000	.0267	....	....	Tensile strength.
25,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	112,000
Elastic limit per square inch of original section	do....	61,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.002133
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.75 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.28*, ″.13, ″.12, ″.10, ″.08, ″.09

No. 586.

Marks, 12 R B₆ M
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

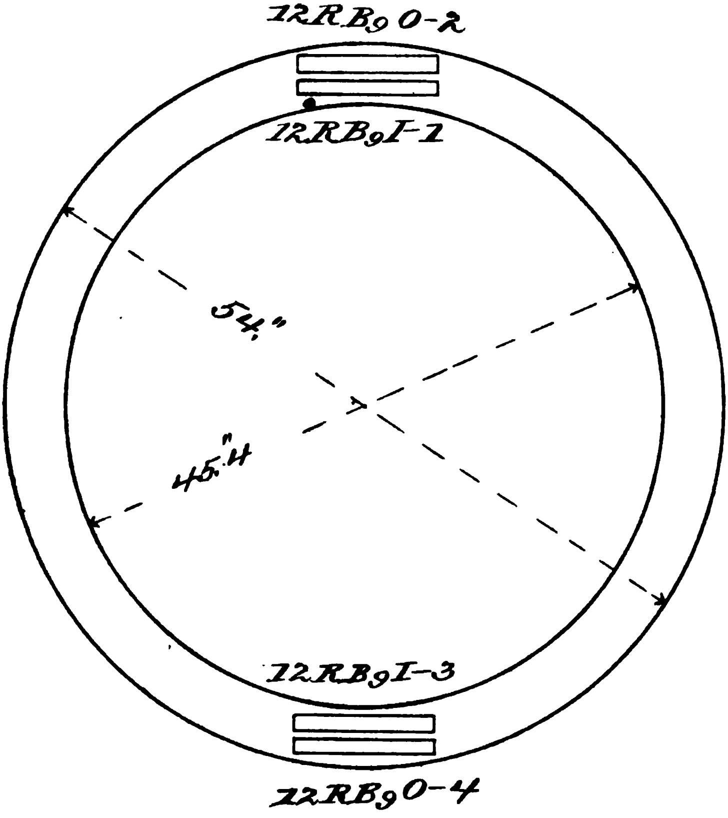
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000600	.000133	0.	....	
6,250	25,000	.000767	.000167	0.	....	
7,500	30,000	.000933	.000166	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001317	.000017	....	....	
10,750	43,000	.001350	.000033	....	....	
11,000	44,000	.001400	.000050	....	....	
11,250	45,000	.001433	.000033	0.	....	
11,500	46,000	.001467	.000034	....	....	
11,750	47,000	.001500	.000033	....	....	
12,000	48,000	.001533	.000033	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001633	.000066	.000017	.000017	
12,750	51,000	.001667	.000034	....	....	
13,000	52,000	.001683	.000016	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001733	.000016	....	....	
13,750	55,000	.001767	.000034	.000017	0.	
14,000	56,000	.001817	.000050	....	....	
14,250	57,000	.001833	.000016	....	....	
14,500	58,000	.001900	.000067	....	....	
14,750	59,000	.001967	.000067	....	....	Elastic limit.
15,000	60,000	.002117	.000150	.000167	.000150	
15,250	61,000	.002600	.000483	....	....	
15,500	62,000	.003133	.000533	....	....	
15,750	63,000	.003750	.000617	....	....	
16,000	64,000	.004500	.000750	....	....	
16,500	66,000	.006167	.001667	....	....	
17,000	68,000	.007783	.001616	....	....	
17,500	70,000	.009133	.001350	....	....	
18,000	72,000	.011383	.002250	....	....	
18,500	74,000	.012750	.001367	....	....	
19,000	76,000	.013967	.001217	....	....	
19,500	78,000	.015667	.001700	....	....	
20,000	80,000	.017333	.001666	....	....	
20,500	82,000	.019033	.001700	....	....	
21,000	84,000	.020833	.001800	....	....	
21,500	86,000	.022833	.002000	....	....	
22,000	88,000	.024883	.002050	....	....	
22,500	90,000	.027417	.002534	....	....	
23,000	92,000	.029917	.002500	....	....	
23,500	94,000	.032667	.002750	....	....	
24,000	96,000	.035883	.003216	....	....	
24,500	93,000	.039333	.003450	....	....	
25,000	100,000	.043500	.004167	....	....	
25,500	102,000	.049050	.005550	....	....	
26,000	104,000	.055000	.005950	....	....	
26,500	106,000	.0633	.0083	....	....	
27,000	108,000	.0783	.0150	....	....	
27,360	109,440	.1133	.0350	....	....	Tensile strength.
24,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..................................pounds.. 109,440
Elastic limit per square inch of original section..................................do... 59,000
Elongation per inch after rupture..................................inch.. 0.1450
Elongation per inch under strain at elastic limit..................................do... .001967
Reduction in diameter at point of rupture..................................do... .124
Reduction in area after rupture, per centum of original section.................................. 39.2
Position of rupture..................................".70 from middle of stem
Character of broken surface..................................dull, smoky; interspersed with granular metal
Elongation of inch sections..................................".10, ".13, ".13, ".30, ".11, ".10

12" B. L. Rifle
Cast Iron Body
Hooped and Tubed with Steel.

Hoop B9



S Ex 36 49 1

No. 581.

Marks, $\frac{12\,R\,B\,I}{1}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000333	.000200	0.	....	
3,750	15,000	.000467	.000134	0.	....	
5,000	20,000	.000633	.000166	0.	....	
6,250	25,000	.000817	.000184	0.	....	
7,500	30,000	.001000	.000183	0.	....	
8,750	35,000	.001150	.000150	0.	....	
10,000	40,000	.001317	.000167	0.	....	
10,250	41,000	.001350	.000033	....	....	
10,500	42,000	.001383	.000033	....	....	
10,750	43,000	.001417	.000034	....	....	
11,000	44,000	.001450	.000033	....	....	
11,250	45,000	.001500	.000050	.000017	.000017	
11,500	46,000	.001550	.000050	....	....	
11,750	47,000	.001583	.000033	....	....	
12,000	48,000	.001617	.000034	....	....	
12,250	49,000	.001650	.000033	....	....	
12,500	50,000	.001700	.000050	.000050	.000033	
12,750	51,000	.001750	.000050	....	....	
13,000	52,000	.001800	.000050	....	....	
13,250	53,000	.001867	.000067	....	....	Elastic limit.
13,500	54,000	.001950	.000083	....	....	
13,750	55,000	.002067	.000117	.000200	.000150	
14,000	56,000	.002250	.000183	....	....	
14,250	57,000	.002400	.000150	....	....	
14,500	58,000	.002800	.000400	....	....	
14,750	59,000	.003050	.000250	....	....	
15,000	60,000	.003633	.000583	.001567	.001367	
15,500	62,000	.005000	.001367	....	....	
16,000	64,000	.006667	.001667	....	....	
16,500	66,000	.008500	.001833	....	....	
17,000	68,000	.010417	.001917	....	....	
17,500	70,000	.012217	.001800	....	....	
18,000	72,000	.014250	.002033	....	....	
18,500	74,000	.016083	.001833	....	....	
19,000	76,000	.018167	.002084	....	....	
19,500	78,000	.020333	.002166	....	....	
20,000	80,000	.022800	.002467	....	....	
20,500	82,000	.025167	.002367	....	....	
21,000	84,000	.027833	.002666	....	....	
21,500	86,000	.030667	.002834	....	....	
22,000	88,000	.032667	.002000	....	....	
22,500	90,000	.037500	.004833	....	....	
23,000	92,000	.041833	.004333	....	....	
23,500	94,000	.046667	.004834	....	....	
24,000	96,000	.052833	.006166	....	....	
24,500	98,000	.060833	.008000	....	....	
25,000	100,000	.0733	.012467	....	....	
25,500	102,000	.0950	.0217	....	....	
25,570	102,280	.1117	.0167	....	....	Tensile strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8511
Hardness		22.14
Tensile strength per square inch of original section	pounds..	102,280
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	.01417
Elongation per inch under strain at elastic limit	do...	.001867
Reduction in diameter at point of rupture	do...	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		."15 from middle of stem

Character of broken surface, dull spongy, interspersed with granular metal at the circumference of the broken surface.

Elongation of inch sections	".09, ".10, ".18, ".27, ".11, ".10

No. 582.

Marks, 12 R B O $_{2}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000583	.000150	0.		
6,250	25,000	.000733	.000150	0.		
7,500	30,000	.000933	.000200	0.		
8,750	35,000	.001100	.000167	0.		
10,000	40,000	.001267	.000167	0.		
10,250	41,000	.001283	.000016			
10,500	42,000	.001300	.000017			
10,750	43,000	.001350	.000050			
11,000	44,000	.001383	.000033			
11,250	45,000	.001400	.000017	0.		
11,500	46,000	.001450	.000050			
11,750	47,000	.001500	.000050			
12,000	48,000	.001533	.000033			
12,250	49,000	.001567	.000034			
12,500	50,000	.001617	.000050	.000050	.000050	
12,750	51,000	.001650	.000033			
13,000	52,000	.001683	.000033			
13,250	53,000	.001733	.000050			
13,500	54,000	.001783	.000050			Elastic limit.
13,750	55,000	.001883	.000100	.000133	.000083	
14,000	56,000	.002033	.000150			
14,250	57,000	.002150	.000117			
14,500	58,000	.002333	.000183			
14,750	59,000	.002500	.000167			
15,000	60,000	.002883	.000383	.000867	.000734	
15,500	62,000	.004000	.001117			
16,000	64,000	.005300	.001300			
16,500	66,000	.007000	.001700			
17,000	68,000	.008750	.001750			
17,500	70,000	.010550	.001800			
18,000	72,000	.012500	.001950			
18,500	74,000	.014167	.001667			
19,000	76,000	.016000	.001833			
19,500	78,000	.018083	.002083			
20,000	80,000	.020083	.002083			
20,500	82,000	.022467	.002384			
21,000	84,000	.025000	.002533			
21,500	86,000	.027667	.002667			
22,000	88,000	.030417	.002750			
22,500	90,000	.033500	.003083			
23,000	92,000	.036917	.003417			
23,500	94,000	.040833	.003916			
24,000	96,000	.045500	.004667			
24,500	98,000	.051167	.005667			
25,000	100,000	.058333	.007166			
25,500	102,000	.0700	.011667			
26,000	104,000	.1033	.0333			
26,020	104,080	.1150	.0117			Tensile strength.
23,800						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,080
Elastic limit per square inch of original section	do ...	54,000
Elongation per inch after rupture	inch..	0.1500
Elongation per inch under strain at elastic limit	do....	.001783
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.90 from middle of stem
Character of broken surface		fine granular; dull center
Elongation of inch sections		″.10, ″.11, ″.12, ″.30*, ″.16 ″.11

No. 583.

Marks, $^{\text{12 R B I}}_{\text{8}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000033	.000033	
2,500	10,000	.000317	.000150	.000033	0.	
3,750	15,000	.000517	.000200	.000050	.000017	
5,000	20,000	000683	.000166	.000050	0.	
6,250	25,000	.000850	.000167	.000050	0.	
7,500	30,000	.001017	.000167	.000067	.000017	
8,750	35,000	.001183	.000166	.000067	0.	
10,000	40,000	.001350	.000167	.000067	0.	
10,250	41,000	.001367	.000017	....	....	
10,500	42,000	001383	.000016	....	....	
10,750	43,000	001450	.000067	....	....	
11,000	44,000	.001467	.000017	....	....	
11,250	45,000	.001500	.000033	.000067	0.	
11,500	46,000	.001567	.000067	....	....	
11,750	47,000	.001583	.000016	....	....	
12,000	48,000	.001633	.000050	....	....	
12,250	49,000	.001667	.000034	....	....	
12,500	50,000	.001700	.000033	.000100	.000033	
12,750	51,000	.001767	.000067	....	....	
13,000	52,000	.001800	.000033	....	....	
13,250	53,000	.001850	,000050	....	....	Elastic limit.
13,500	54,000	.001950	.000100	....	....	
13,750	55,000	.002033	.000083	.000200	.000100	
14,000	56,000	.002133	.000100	....	....	
14,250	57,000	.002300	.000167	....	....	
14,500	58,000	.002550	.000250	....	....	
14,750	59,000	.002800	.000250	....	....	
15,000	60,000	.003383	.000583	.001267	.001067	
15,500	62,000	.004500	.001117	....	....	
16,000	64,000	.006283	.001783	....	....	
16,500	66,000	.008467	.002184	....	....	
17,000	68,000	.010250	.001783	....	....	
17,500	70,000	.012167	.001917	....	....	
18,000	72,000	.014050	.001883	....	....	
18,500	74,000	.016083	.002033	....	....	
19,000	76,000	.017917	.001834	....	....	
19,500	78,000	.020167	.002250	....	....	
20,000	80,000	.022500	.002333	....	....	
20,500	82,000	.025000	.002500	....	....	
21,000	84,000	.027700	.002700	....	....	
21,500	86,000	.030583	.002883	....	....	
22,000	88,000	.033833	.003250	....	....	
22,500	90,000	.037550	.003717	....	....	
23,000	92,000	.041917	.004367	....	....	
23,500	94,000	.046500	.004583	....	....	
24,000	96,000	.052500	.006000	....	....	
24,500	98,000	.060167	.007667	....	....	
25,000	100,000	.0717	.011533	....	....	
25,500	102,000	.0933	.0216	....	....	
25,550	102,200	.1083	.0150	....	....	Tensile strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102,200
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		3″.1 from neck
Character of broken surface		dull, spongy, interspersed with granular metal
Elongation of inch sections		″.10, ″.25*, ″.18, ″.11, ″.10, ″.09

No. 584.

Marks, $^{12\ \mathrm{R\ B\ O}}_{4}$

Diameter, ".564.

Sectional area, .25 square inch.

Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000267	.000150	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000583	.000150	0.	....	
6,250	25,000	.000733	.000150	0.	....	
7,500	30,000	.000900	.000167	0.	....	
8,750	35,000	.001083	.000183	0.	....	
10,000	40,000	.001250	.000167	0.	....	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001350	.000050	....	....	
11,000	44,000	.001383	.000033	....	....	
11,250	45,000	.001417	.000334	0.	....	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001550	.000067	....	....	
12,250	49,000	.001583	.000033	....	....	
12,500	50,000	.001617	.000334	0.	....	
12,750	51,000	.001683	.000066	....	....	
13,000	50,000	.001750	.000067	....	....	
13,250	52,000	.001783	.000033	....	....	Elastic limit.
13,500	54,000	.001883	.000100	....	....	
13,750	55,000	.002033	.000150	.000200	.000200	
14,000	56,000	.002133	.000100	....	....	
14,250	57,000	.002300	.000167	....	....	
14,500	58,000	.002633	.000333	....	....	
14,750	59,000	.002883	.000250	....	....	
15,000	60,000	.003750	.000867	.001700	.001500	
15,500	62,000	.005133	.001383	....	....	
16,000	64,000	.006833	.001700	....	....	
16,500	66,000	.008800	.001967	....	....	
17,000	68,000	.010550	.001750	....	....	
17,500	70,000	.012667	.002117	....	....	
18,000	72,000	.014583	.001916	....	....	
18,500	74,000	.016500	.001917	....	....	
19,000	76,000	.018333	.001833	....	....	
19,500	78,000	.020833	.002500	....	....	
20,000	80,000	.023083	.002250	....	....	
20,500	82,000	.025667	.002584	....	....	
21,000	84,000	.028333	.002666	....	....	
21,500	86,000	.031200	.002867	....	....	
22,000	88,000	.034417	.003217	....	....	
22,500	90,000	.038333	.003916	....	....	
23,000	92,000	.043333	.005000	....	....	
23,500	94,000	.047917	.004584	....	....	
24,000	96,000	.054000	.006083	....	....	
24,500	98,000	.061667	.007667	....	....	
25,000	100,000	.0783	.016633	....	....	
25,500	102,000	.0983	.0200	....	....	
25,560	102,240	.1200	.0217	....	....	Tensile strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

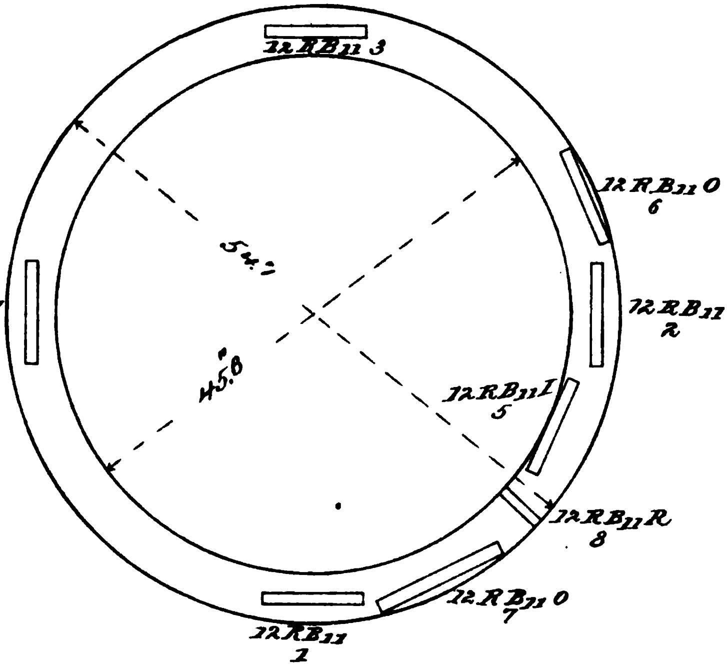
Tensile strength per square inch of original section.................................pounds.. 102,240
Elastic limit per square inch of original section.................................do.... 53,000
Elongation per inch after rupture.................................inch.. 0.1688
Elongation per inch under strain at elastic limit.................................do.... .001783
Reduction in diameter at point of rupture.................................do.... .124
Reduction in area after rupture, per centum of original section................................. 39.2
Position of rupture.................................".1.00 from neck
Character of broken surface, dull, spongy, with granular metal at the circumference of the broken surface of
Elongation of inch sections.................................".03*, ".16, ".17 ".14, ".11, ".13

12" B.L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop B11



No. 480.

Tension Test.

Marks on bar, $^{12}\underset{1}{\text{R B}}^{11}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6.″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000083	.000083	0.		Initial load.
2,500	10,000	.000283	.000200	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000617	.000167	0.		
6,250	25,000	.000783	.000166	0.		
7,500	30,000	.000950	.000167	0.		
8,750	35,000	.001117	.000167	0.		
10,000	40,000	.001283	.000166	0.		
10,250	41,000	.001300	.000017			
10,500	42,000	.001333	.000033			
10,750	43,000	.001367	.000034			
11,000	44,000	.001400	.000033			
11,250	45,000	.001433	.000033	0.		
11,500	46,000	.001467	.000034			
11,750	47,000	.001500	.000033			
12,000	48,000	.001533	.000033			
12,250	49,000	.001567	.000034			
12,500	50,000	.001617	.000050	.000033	.000033	
12,750	51,000	.001667	.000050			
13,000	52,000	.001700	.000033			
13,250	53,000	.001733	.000033			
13,500	54,000	.001767	.000034			Elastic limit.
13,750	55,000	.001900	.000133	.000150	.000117	
14,000	56,000	.002367	.000467			
14,250	57,000	.002650	.000283			
14,500	58,000	.003250	.000600			
14,750	59,000	.003917	.000667			
15,000	60,000	.004817	.000900	.002667	.002517	
15,500	62,000	.006000	.001183			
16,000	64,000	.007800	.001800			
16,500	66,000	.009367	.001567			
17,000	68,000	.011117	.001750			
17,500	70,000	.012800	.001683			
18,000	72,000	.014500	.091700			
18,500	74,000	.016567	.002067			
19,000	76,000	.018533	.001966			
19,500	78,000	.020667	.002134			
20,000	80,000	.022833	.002166			
20,500	82,000	.025500	.002667			
21,000	84,000	.028167	.002667			
21,500	86,000	.030867	.002700			
22,000	88,000	.033917	.003050			
22,500	90,000	.038500	.004583			
23,000	92,000	.042667	.004167			
23,500	94,000	.047700	.005033			
24,000	96,000	.054000	.006300			
24,500	98,000	.063667	.009667			
25,000	100,000	.0850	.021333			
25,300	101,200	.1200	.0350			Ultimate strength.
22,500						Load at time of rupture.

General summary.

Specific gravity	7.8564
Hardness	21,64
Tensile strength per square inch of original section ... pounds	101,200
Elastic limit per square inch of original section ... do	54,000
Elongation per inch after rupture ... inch	0.1600
Elongation per inch under strain at elastic limit ... do	.001767
Reduction in diameter at point of rupture ... do	.124
Reduction in area after rupture, per centum of original section	39.2
Position of rupture	″.80 from middle of stem
Character of broken surface	fine granular, with dull center
Elongation of inch sections	″.09, ″.17 (″.33 fractured section), ″.13, ″.12, ″.12

No. 481.

Tension Test.

Marks on bar, $^{12}\frac{R}{2}B^{11}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000183	.000116	0.	....	
3,750	15,000	.000350	.000167	0.	....	
5,000	20,000	.000517	.000167	0.	....	
6,250	25,000	.000700	,000183	0.	....	
7,500	30,000	.000883	.000183	0.	....	
8,750	35,000	.001083	.000200	0.	....	
10,000	40,000	.001233	.000150	0.	....	
10,250	41,000	.001283	.000050	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001517	.000050	....	....	
12,250	49,000	.001550	.000033	....	....	
12,500	50,000	.001600	.000050	.000050	.000050	
12,750	51,000	.001650	.000050	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001783	.000066	....	....	
13,750	55,000	.001850	.000067	.000100	.000050	Elastic limit.
14,000	56,000	.002033	.000183	....	....	
14,250	57,000	.002200	.000167	....	....	
14,500	58,000	.002517	.000317	....	....	
14,750	59,000	.002850	.000333	....	....	
15,000	60,000	.003517	.000667	.001467	.001367	
15,500	62,000	.004683	.001166	....	....	
16,000	64,000	.006200	.001517	....	....	
16,500	66,000	.007633	.001433	....	....	
17,000	68,000	.009250	.001617	....	....	
17,500	70,000	.010967	.001717	....	....	
18,000	72,000	.012550	.001583	....	....	
18,500	74,000	.014417	.001867	....	....	
19,000	76,000	.016167	.001750	....	....	
19,500	78,000	.018167	.002000	....	....	
20,000	80,000	.020167	.002000	....	....	
20,500	82,000	.022217	.002050	....	....	
21,000	84,000	.024117	.002200	....	....	
21,500	86,000	.026867	.002450	....	....	
22,000	88,000	.029583	.002716	....	....	
22,500	90,000	.032533	.002950	....	....	
23,000	92,000	.035500	.002967	....	....	
23,500	94,000	.039333	.003833	....	....	
24,000	96,000	.044000	.004667	....	....	
24,500	98,000	.049367	.005367	....	....	
25,000	100,000	.055833	.006466	....	....	
25,500	102,000	.067083	.011250	....	....	
26,000	104,000	.0917	.024617	....	....	
26,100	104,400	.1117	.0200	....	....	Ultimate strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,400
Elastic limit per square inch of original section	do ...	55,000
Elongation per inch after rupture	inch..	0.1333
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1".50 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		".12 (.27 fractured section), ".11, ".11, ".10, ".09

No. 482.

Tension Test.

Marks on bar, $^{12}\mathrm{R}\overset{\mathrm{B}}{_{3}}{}^{\mathrm{n}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000600	.000167	0.	....	
6,250	25,000	.000750	.000150	0.	....	
7,500	30,000	.000917	.000167	0.	....	
8,750	35,000	.001083	.000166	0.	....	
10,000	40,000	.001250	.000167	0.	....	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001450	.000050	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001517	.000034	....	....	
12,250	49,000	.001550	.000033	....	....	
12,500	50,000	.001600	.000050	.000050	....	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001700	.000067	....	....	
13,250	53,000	.001733	.000033	....	....	Elastic limit.
13,500	54,000	.001850	.000117	....	....	
13,750	55,000	.002033	.000183	.000267	....	
14,000	56,000	.002333	.000300	....	....	
14,250	57,000	.002533	.000200	....	....	
14,500	58,000	.002933	.000400	....	....	
14,750	59,000	.003467	.000534	....	....	
15,000	60,000	.004200	.000733	.002133	....	
15,500	62,000	.005583	.001383	....	....	
16,000	64,000	.007233	.001650	....	....	
16,500	66,000	.008900	.001667	....	....	
17,000	68,000	.010417	.001517	....	....	
17,500	70,000	.012167	.001750	....	....	
18,000	72,000	.013967	.001800	....	....	
18,500	74,000	.016083	.002116	....	....	
19,000	76,000	.018167	.002084	....	....	
19,500	78,000	.019833	.001666	....	....	
20,000	80,000	.022000	.002167	....	....	
20,500	82,000	.024500	.002500	....	....	
21,000	84,000	.026750	.002250	....	....	
21,500	86,000	.029250	.002500	....	....	
22,000	88,000	.032333	.003083	....	....	
22,500	90,000	.035833	.003500	....	....	
23,000	92,000	.039667	.003834	....	....	
23,500	94,000	.044033	.004366	....	....	
24,000	96,000	.048833	.004800	....	....	
24,500	98,000	.056083	.007250	....	....	
25,000	100,000	.064500	.008417	....	....	
25,500	102,000	.0900	.0255	....	....	
25,620	102,480	.1150	.0250	....	....	Ultimate strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..........pounds.. 102,480
Elastic limit per square inch of original section..........do ... 53,000
Elongation per inch after rupture..........inch. 0.1450
Elongation per inch under strain at elastic limit..........do.... .001733
Reduction in diameter at point of rupture..........do ... .114
Reduction in area after rupture, per centum of original section.......... ... 36.4
Position of rupture..........″.90 from neck
Character of broken surface..........fine granular, with dull center
Elongation of inch sections..........(″.27 fractured section), ″.16, ″.11, ″.11, ″.11, ″.11

No. 481.

Tension Test.

Marks on bar, $^{12}\underset{2}{\text{R}}\text{B}^{11}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000183	.000116	0.	....	
3,750	15,000	.000350	.000167	0.	....	
5,000	20,000	.000517	.000167	0.	....	
6,250	25,000	.000700	,000183	0.	....	
7,500	30,000	.000883	.000183	0.	....	
8,750	35,000	.001083	.000200	0.	....	
10,000	40,000	.001233	.000150	0.	....	
10,250	41,000	.001283	.000050	....	....	
10,500	42,000	.001317	.000034	....	....	
10,750	43,000	.001333	.000016	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001517	.000050	....	....	
12,250	49,000	.001550	.000033	....	....	
12,500	50,000	.001600	.000050	.000050	.000050	
12,750	51,000	.001650	.000050	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	
13,500	54,000	.001783	.000066	....	....	
13,750	55,000	.001850	.000067	.000100	.000050	Elastic limit.
14,000	56,000	.002033	.000183	....	....	
14,250	57,000	.002200	.000167	....	....	
14,500	58,000	.002517	.000317	....	....	
14,750	59,000	.002850	.000333	....	....	
15,000	60,000	.003517	.000667	.001467	.001367	
15,500	62,000	.004683	.001166	....	....	
16,000	64,000	.006200	.001517	....	....	
16,500	66,000	.007633	.001433	....	....	
17,000	68,000	.009250	.001617	....	....	
17,500	70,000	.010967	.001717	....	....	
18,000	72,000	.012550	.001583	....	....	
18,500	74,000	.014417	.001867	....	....	
19,000	76,000	.016167	.001750	....	....	
19,500	78,000	.018167	.002000	....	....	
20,000	80,000	.020167	.002000	....	....	
20,500	82,000	.022217	.002050	....	....	
21,000	84,000	.024417	.002200	....	....	
21,500	86,000	.026867	.002450	....	....	
22,000	88,000	.029583	.002716	....	....	
22,500	90,000	.032533	.002950	....	....	
23,000	92,000	.035500	.002967	....	....	
23,500	94,000	.039333	.003833	....	....	
24,000	96,000	.044000	.004667	....	....	
24,500	98,000	.049367	.005367	....	....	
25,000	100,000	.055833	.006466	....	....	
25,500	102,000	.067083	.011250	....	....	
26,000	104,000	.0917	.024617	....	....	
26,100	104,400	.1117	.0200	....	....	Ultimate strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,400
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.1833
Elongation per inch under strain at elastic limit	do....	.001850
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.50 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.12 (″.27 fractured section), ″.11, ″.11, ″.10, ″.09

No. 482.

Tension Test.

Marks on bar, $^{12}\mathrm{R\,B}^{11}_{3}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000600	.000167	0.		
6,250	25,000	.000750	.000150	0.		
7,500	30,000	.000917	.000167	0.		
8,750	35,000	.001083	.000166	0.		
10,000	40,000	.001250	.000167	0.		
10,250	41,000	.001267	.000017			
10,500	42,000	.001300	.000033			
10,750	43,000	.001333	.000033			
11,000	44,000	.001367	.000034			
11,250	45,000	.001400	.000033	0.		
11,500	46,000	.001450	.000050			
11,750	47,000	.001483	.000033			
12,000	48,000	.001517	.000034			
12,250	49,000	.001550	.000033			
12,500	50,000	.001600	.000050	.000050		
12,750	51,000	.001633	.000033			
13,000	52,000	.001700	.000067			
13,250	53,000	.001733	.000033			Elastic limit.
13,500	54,000	.001850	.000117			
13,750	55,000	.002033	.000183	.000267		
14,000	56,000	.002333	.000300			
14,250	57,000	.002533	.000200			
14,500	58,000	.002933	.000400			
14,750	59,000	.003467	.000534			
15,000	60,000	.004200	.000733	.002133		
15,500	62,000	.005583	.001383			
16,000	64,000	.007233	.001650			
16,500	66,000	.008900	.001667			
17,000	68,000	.010417	.001517			
17,500	70,000	.012167	.001750			
18,000	72,000	.013967	.001800			
18,500	74,000	.016083	.002116			
19,000	76,000	.018167	.002084			
19,500	78,000	.019833	.001666			
20,000	80,000	.022000	.002167			
20,500	82,000	.024500	.002500			
21,000	84,000	.026750	.002250			
21,500	86,000	.029250	.002500			
22,000	88,000	.032333	.003083			
22,500	90,000	.035833	.003500			
23,000	92,000	.039667	.003834			
23,500	94,000	.044033	.004366			
24,000	96,000	.048833	.004800			
24,500	98,000	.056083	.007250			
25,000	100,000	.064500	.008417			
25,500	102,000	.0900	.0255			
25,620	102,480	.1150	.0250			Ultimate strength.
23,500						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	102,480
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1450
Elongation per inch under strain at elastic limit	do	.001733
Reduction in diameter at point of rupture	do	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.90 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		(″.27 fractured section), ″.16, ″.11, ″.11, ″.11, ″.11

No. 483.

Tension Test.

Marks on bar, $^{12}\,\mathrm{R}\,^{\mathrm{Bn}}_{4}$

Diameter, ″.564.

Sectional area, .25 square inch.

Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000300	.000167	0.	....	
3,750	15,000	.000467	.000167	0.	....	
5,000	20,000	.000617	.000150	0.	....	
6,250	25,000	.000783	.000116	0.	....	
7,500	30,000	.000933	.000150	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001250	.000150	0.	....	
10,250	41,000	.001267	.000017	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	0.	....	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001500	.000033	....	....	
12,000	48,000	.001533	.000033	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001600	.000033	.000033	.000033	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001700	.000067	....	....	
13,250	53,000	.001717	.000017	....	....	Elastic lim.
13,500	54,000	.001817	.000100	....	....	
13,750	55,000	.002017	.000200	.000217	.000184	
14,000	56,000	.002217	.000200	....	....	
14,250	57,000	.002700	.000483	....	....	
14,500	58,000	.002967	.000267	....	....	
14,750	59,000	.003700	.000733	....	....	
15,000	60,000	.004750	.001050	.002633	.002416	
15,500	62,000	.005833	.001083	....	....	
16,000	64,000	.007500	.001667	....	....	
16,500	66,000	.009000	.001500	....	....	
17,000	68,000	.010917	.001917	....	....	
17,500	70,000	.012833	.001916	....	....	
18,000	72,000	.014467	.001634	....	....	
18,500	74,000	.016333	.001866	....	....	
19,000	76,000	.018333	.002000	....	....	
19,500	78,000	.020250	.001917	....	....	
20,000	80,000	.022583	.002333	....	....	
20,500	82,000	.025000	.002417	....	....	
21,000	84,000	.027417	.002417	....	....	
21,500	86,000	.030367	.002950	....	....	
22,000	88,000	.033250	.002883	....	....	
22,500	90,000	.036833	.003583	....	....	
23,000	92,000	.041000	.004167	....	....	
23,500	94,000	.046167	.005167	....	....	
24,000	96,000	.052167	.006000	....	....	
24,500	98,000	.060700	.008533	....	....	
25,000	100,000	.072500	.011800	....	....	
25,460	101,840	.1133	.0408	....	....	Ultimate strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	101,840
Elastic limit per square inch of original section	do....	53,000
Elongation per inch after rupture	inch..	0.1433
Elongation per inch under strain at elastic limit	do....	001717
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″.10 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		(″.23 fractured section), ″.19, ″.13, ″.13, ″.12, ″.09

No. 548.

Marks, $^{12\ \mathrm{R\,B}\ 11\ 1}_{\quad\ \ 5}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000467	.000184	0.	....	
5,000	20,000	.000650	.000183	0.	....	
6,250	25,000	.000833	.000183	0.	....	
7,500	30,000	.001000	.000167	0.	....	
8,750	35,000	.001183	.000183	0.	....	
10,000	40,000	.001383	.000200	0.	....	
10,250	41,000	.001417	.000034	....	....	
10,500	42,000	.001467	.000050	....	....	
10,750	43,000	.001517	.000050	....	....	
11,000	44,000	.001550	.000038	....	....	
11,250	45,000	.001600	.000050	0.	....	
11,500	46,000	.001633	.000033	....	....	
11,750	47,000	.001700	.000067	....	....	
12,000	48,000	.001733	.000033	....	....	
12,250	49,000	.001767	.000034	....	....	
12,500	50,000	.001800	.000033	0.	....	
12,750	51,000	.001867	.000067	....	....	
13,000	52,000	.001900	.000038	....	....	
13,250	53,000	.001933	.000033	....	....	
13,500	54,000	.001967	.000034	....	....	
13,750	55,000	.002033	.000066	0.	....	
14,000	56,000	.002100	.000067	....	....	
14,250	57,000	.002133	.000038	....	....	
14,500	58,000	.002183	.000050	....	....	Elastic limit.
14,750	59,000	.002367	.000184	....	....	
15,000	60,000	.002683	.000316	.000317	.000317	
15,500	62,000	.003467	.000784	....	....	
16,000	64,000	.004967	.001500	....	....	
16,500	66,000	.006683	.001716	....	....	
17,000	68,000	.007867	.001184	....	....	
17,500	70,000	.009067	.001600	....	....	
18,000	72,000	.011083	.001416	....	....	
18,500	74,000	.012667	.001584	....	....	
19,000	76,000	.014833	.002166	....	....	
19,500	78,000	.016500	.001667	....	....	
20,000	80,000	.018417	.001917	....	....	
20,500	82,000	.021333	.002916	....	....	
21,000	84,000	.022000	.000667	....	....	
21,500	86,000	.024667	.002667	....	....	
22,000	88,000	.026867	.002200	....	....	
22,500	90,000	.029017	.002150	....	....	
23,000	92,000	.031667	.002650	....	....	
24,500	94,000	.035083	.003416	....	....	
24,000	96,000	.038333	.003250	....	....	
24,500	98,000	.042850	.004517	....	....	
25,000	100,000	.047750	.004900	....	....	
25,500	102,000	.054833	.007083	....	....	
26,000	104,000	.0683	.013467	....	....	
26,500	106,000	.0833	.0150	....	....	
26,750	107,000	.1100	.0267	....	....	Tensile strength.
24,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	107,000
Elastic limit per square inch of original section	do....	58,000
Elongation per inch after rupture	inch..	0.1483
Elongation per inch under strain at elastic limit	do....	.002183
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		2″ from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.11, ″.27*, ″.15, ″.13, ″.12, ″.11

No. 549.

Marks, $^{12\,R\,B_{11}\,O}_{\quad 6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.		
2,500	10,000	.000283	.000166	0.		
3,750	15,000	.000450	.000167	0.		
5,000	20,000	.000633	.000183	0.		
6,250	25,000	.000800	.000167	0.		
7,500	30,000	.001017	.000217	0.		
8,750	35,000	.001200	.000183	0.		
10,000	40,000	.001383	.000183	0.		
10,250	41,000	.001417	.000034			
10,500	42,000	.001467	.000050			
10,750	43,000	.001500	.000033			
11,000	44,000	.001533	.000033			
11,250	45,000	.001583	.000050	0.		
11,500	46,000	.001650	.000067			
11,750	47,000	.001683	.000033			
12,000	48,000	.001717	.000034			
12,250	49,000	.001750	.000033			
12,500	50,000	.001783	.000033	0.		
12,750	51,000	.001850	.000067			
13,000	52,000	.001883	.000033			
13,250	53,000	.001933	.000050			
13,500	54,000	.001967	.000034			
13,750	55,000	.002017	.000050	0.		
14,000	56,000	.002067	.000050			
14,250	57,000	.002117	.000050			Elastic limit.
14,500	58,000	.002200	.000083			
14,750	59,000	.002383	.000183			
15,000	60,000	.002783	.000400	.000450	.000450	
15,250	61,000	.003200	.000417			
15,500	62,000	.003800	.000600			
15,750	63,000	.004533	.000733			
16,000	64,000	.005583	.001050			
16,250	65,000	.006300	.000717			
16,500	66,000	.007217	.000917			
16,750	67,000	.007783	.000566			
17,000	68,000	.008733	.000950			
17,250	69,000	.000383	.000650			
17,500	70,000	.010483	.001100			
18,000	72,000	.012300	.001817			
18,500	74,000	.014000	.001700			
19,000	76,000	.016067	.002067			
19,500	78,000	.017550	.001483			
20,000	80,000	.019467	.001917			
20,500	82,000	.020917	.001450			
21,000	84,000	.023750	.002833			
21,500	86,000	.025867	.002117			
22,000	88,000	.028000	.002133			
22,500	90,000	.030017	.002017			
23,000	92,000	.034533	.003616			
23,500	94,000	.038000	.003467			
24,000	96,000	.042167	004167			
24,500	98,000	.047250	.005083			
25,000	100,000	.054000	.006750			
25,500	102,000	.0667	.0127			
26,000	104,000	.0800	.0133			
26,500	106,000	.1133	.0333			Tensile strength.
24,000						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	106,000
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.1583
Elongation per inch under strain at elastic limit	do....	.002117
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.70 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.09, ″.29*, ″.11, ″.16, ″.17, ″13

No. 440.

Compression Test.

Marks on bar, $^{12}\,\mathrm{R\,B}_{7}\,\mathrm{nO}$
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000150	.000150	.000040	.000040	
10,000	10,000	.000310	.000160	.000040	0.	
15,000	15,000	.000450	.000140	.000040	0.	
20,000	20,000	.000630	.000180	.000040	0.	
25,000	25,000	.000800	.000170	.000040	0.	
30,000	30,000	.000970	.000170	.000050	.000010	
35,000	35,000	.001120	.000150	.000060	.000010	
40,000	40,000	.001290	.000170	.000060	0.	
41,000	41,000	.001320	.000030	....	....	
42,000	42,000	.001370	.000050	....	....	
43,000	43,000	.001400	.000030	....	....	
44,000	44,000	.001430	.000030	....	....	
45,000	45,000	.001470	.000040	.000060	0.	
46,000	46,000	.001510	.000040	....	....	
47,000	47,000	.001530	.000020	....	....	
48,000	48,000	.001570	.000040	....	....	
49,000	49,000	.001610	.000040	....	....	
50,000	50,000	.001660	.000050	.000090	.000030	
51,000	51,000	.001710	.000050	....	....	
52,000	52,000	.001750	.000040	....	....	
53,000	53,000	.001810	.000060	....	....	
54,000	54,000	.001870	.000060	....	....	Elastic limit.
55,000	55,000	.002030	.000160	.000280	.000190	
56,000	56,000	.002320	.000290	....	....	
57,000	57,000	.002710	.000390	....	....	
58,000	58,000	.003350	.000640	....	....	
59,000	59,000	.004280	.000930	....	....	
60,000	60,000	.006250	.001970	.004000	.003720	
					Deflection chord 10″	
61,000	61,000	....	....	....	.10	
62,000	62,000	....	....	....	.15	
63,000	63,000	....	....	....	.17	
63,200	63,200	....	....	....	.30	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	54,000
Compression per inch under stress at elastic limit	inch..	0.001870
Ultimate strength per square inch of original section	pounds..	63,200
Manner of failure		triple flexure

Bent 90°, when the bar fractured; beginning at a small defect ″.05 diameter on the tension side, ¼″ at one side of the middle of the bend. Appearance granular, radiating from the defective spot.

No. 446.

Compression Test.

Marks on bar, $12\,\underset{8}{\mathrm{RB}}_{11}\,\mathrm{R}$
Length, 3″.51.
Diameter, ″.362.
Sectional area, 1.03 square inches.
Ultimate strength, 7,050 pounds = 68,450 pounds per square inch.
Failed by triple flexure.
Bent 155° when fracture occurred. Appearance, fine granular.

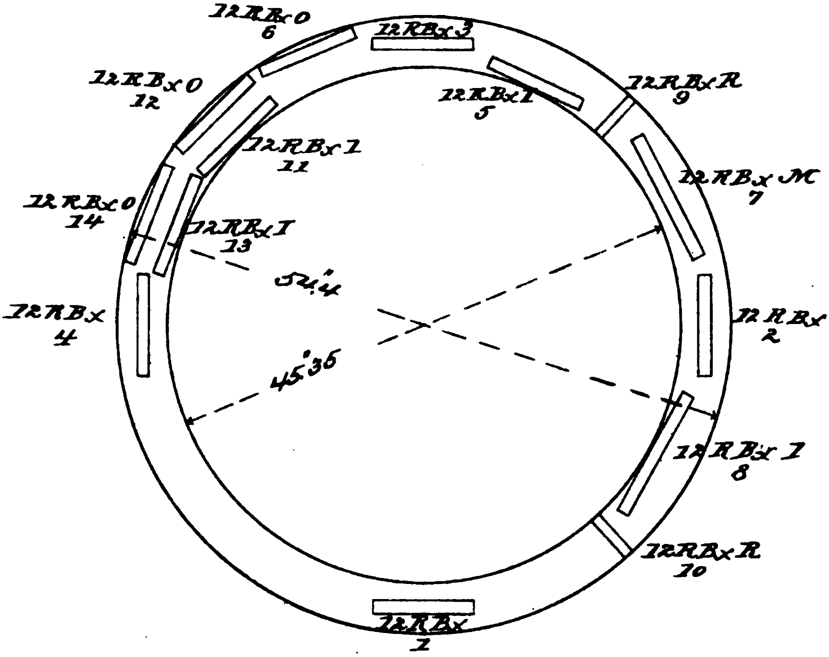
12" B.L. Rifle

Cast Iron Body

Hooped and Tubed with Steel.

Hoop Bx

Experimental section



S Ex 36 49 1

No. 464.

Tension Test.

r, $^{12\,\text{RB}_1}_{1}$

.564.

ea, .25 square inch.

are .	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
ls.	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
00	0.	0.	0.	0.	**Initial load.**
00	.000067	.000067	0.	....	
00	.000233	.000166	0.	....	
00	.000400	.000167	0.	....	
00	.000567	.000167	0.	....	
00	.000700	.000133	0.	....	
00	.000867	.000167	0.	....	
00	.001067	.000200	0.	....	
00	.001233	.000166	0.	....	
00	.001267	.000034	....	....	
00	.001283	.000016	....	....	
00	.001317	.000034	....	....	
00	.001350	.000033	....	....	
00	.001383	.000033	0.	....	
00	.001400	.000017	....	....	
00	.001450	.000050	....	....	
00	.001483	.000033	....	....	
00	.001517	.000034	....	....	
00	.001550	.000033	0.	....	
00	.001600	.000050	....	....	
00	.001650	.000050	....	....	
00	.001700	.000050	....	....	
00	.001750	.000050	....	....	**Elastic limit.**
00	.001833	.000083	.000100	.000100	
00	.002800	.000967	....	....	
00	.003633	.000833	....	....	
00	.004083	.000450	....	....	
00	.004667	.000584	....	....	
00	.005467	.000800	....	....	
00	.006633	.001166	....	....	
00	.008000	.001367	....	....	
00	.009667	.001667	....	....	
00	.011200	.001533	....	....	
00	.012833	.001633	....	....	
00	.014500	.001667	....	....	
00	.016167	.001667	....	....	
00	.018000	.001833	....	....	
00	.019833	.001833	....	....	
00	.021867	.002034	....	....	
00	.024000	.002133	....	....	
00	.026333	.002333	....	....	
00	.029167	.002834	....	....	
00	.031833	.002666	....	....	
00	.034667	.002834	....	....	
00	.038333	.003666	....	....	
00	.042167	.003834	....	....	
00	.047167	.005000	....	....	
00	.053167	.006000	....	....	
00	.060833	.007666	....	....	
00	.0767	.015857	....	....	
00	.0933	.0166	....	....	
20	.1150	.0217	....	....	Ultimate strength.
----	....	....	....	....	Load at time of rupture.

General summary.

.... 7.8581
.... 20.36
square inch of original section................................pounds.. 104,320
are inch of original section..................................do.... 54,000
after rupture...inch.. 0.1383
under strain at elastic limit.................................do.... .001750
er at point of rupture..do.... .114
ter rupture, per centum of original section 36.4
....".80 from neck
surface.....................................fine granular with dull center
ections ....(".28 fractured section), ".14, ".12, ".10, ".10, ".09

No. 464.

Tension Test.

Marks on bar, $^{12}\frac{RB_{1}}{1}$.
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000867	.000167	0.	....	
8,750	35,000	.001067	.000200	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001283	.000016	....	....	
10,750	43,000	.001317	.000034	....	....	
11,000	44,000	.001350	.000033	....	....	
11,250	45,000	.001383	.000033	0.	....	
11,500	46,000	.001400	.000017	....	....	
11,750	47,000	.001450	.000050	....	....	
12,000	48,000	.001483	.000033	....	....	
12,250	49,000	.001517	.000034	....	....	
12,500	50,000	.001550	.000033	0.	....	
12,750	51,000	.001600	.000050	....	....	
13,000	52,000	.001650	.000050	....	....	
13,250	53,000	.001700	.000050	....	....	
13,500	54,000	.001750	.000050	....	....	Elastic limit.
13,750	55,000	.001833	.000083	.000100	.000100	
14,000	56,000	.002800	.000967	....	....	
14,250	57,000	.003633	.000833	....	....	
14,500	58,000	.004083	.000450	....	....	
14,750	59,000	.004667	.000584	....	....	
15,000	60,000	.005467	.000800	....	....	
15,500	62,000	.006633	.001166	....	....	
16,000	64,000	.008000	.001367	....	....	
16,500	66,000	.009667	.001667	....	....	
17,000	68,000	.011200	.001533	....	....	
17,500	70,000	.012833	.001633	....	....	
18,000	72,000	.014500	.001667	....	....	
18,500	74,000	.016167	.001667	....	....	
19,000	76,000	.018000	.001833	....	....	
19,500	78,000	.019833	.001833	....	....	
20,000	80,000	.021867	.002034	....	....	
20,500	82,000	.024000	.002133	....	....	
21,000	84,000	.026333	.002333	....	....	
21,500	86,000	.029167	.002834	....	....	
22,000	88,000	.031833	.002666	....	....	
22,500	90,000	.034667	.002834	....	....	
23,000	92,000	.038333	.003666	....	....	
23,500	94,000	.042167	.003834	....	....	
24,000	96,000	.047167	.005000	....	....	
24,500	98,000	.053167	.006000	....	....	
25,000	100,000	.060833	.007666	....	....	
25,500	102,000	.0767	.015857	....	....	
26,000	104,000	.0933	.0166	....	....	
26,080	104,820	.1150	.0217	....	....	Ultimate strength.
23,500	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8581
Hardness		20.86
Tensile strength per square inch of original section	pounds..	104,820
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1383
Elongation per inch under strain at elastic limit	do....	.001750
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		″.80 from neck
Character of broken surface		fine granular with dull center
Elongation of inch sections		(″.28 fractured section), ″.14, ″.12, ″.10, ″.10, ″.09

No. 465.

Tension Test.

Marks on bar, $^{12\frac{R}{2}B_x}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000433	.000166	0.	....	
5,000	20,000	.000583	.000150	0.	....	
6,250	25,000	.000750	.000167	0.	....	
7,500	30,000	.000917	.000167	0.	....	
8,750	35,000	.001083	.000166	0.	....	
10,000	40,000	.001267	.000184	0.	....	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001300	.000017	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001383	.000050	....	....	
11,250	45,000	.001417	.000034	0.	....	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001533	.000050	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001617	.000050	.000017	.000017	
12,750	51,000	.001650	.000033	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001717	.000034	....	....	Elastic limit.
13,500	54,000	.001800	.000083	....	....	
13,750	55,000	.002083	.000283	.000367	.000350	
14,000	56,000	.002833	.000750	....	....	
14,250	57,000	.003933	.001100	....	....	
14,500	58,000	.004750	.000817	....	....	
14,750	59,000	.005333	.000583	....	....	
15,000	60,000	.006017	.000684	.003800	.008433	
15,500	62,000	.007017	.001000	....	....	
16,000	64,000	.008500	.001483	....	....	
16,500	66,000	.010000	.001500	....	....	
17,000	68,000	.011500	.001500	....	....	
17,500	70,000	.013000	.001500	....	....	
18,000	72,000	.014667	.001667	....	....	
18,500	74,000	.016667	.002000	....	....	
19,000	76,000	.018300	.001633	....	....	
19,500	78,000	.020167	.001867	....	....	
20,000	80,000	.021917	.001750	....	....	
20,500	82,000	.024133	.002216	....	....	
21,000	84,000	.026333	.002200	....	....	
21,500	86,000	.029000	.002667	....	....	
22,000	88,000	.032333	.003333	....	....	
22,500	90,000	.035167	.002834	....	....	
23,000	92,000	.038167	.003000	....	....	
23,500	94,000	.041833	.003666	....	....	
24,000	96,000	.046333	.004500	....	....	
24,500	08,000	.051833	.005500	....	....	
25,000	100,000	.0617	.009867	....	....	
25,500	102,000	.0783	.0116	....	....	
26,000	104,000	.1050	.0317	....	....	Ultimate strength.
24,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section .... pounds..	104,000
Elastic limit per square inch of original section .... do....	53,000
Elongation per inch after rupture .... inch..	0.1267
Elongation per inch under strain at elastic limit .... do....	.001717
Reduction in diameter at point of rupture .... do....	.114
Reduction in area after rupture, per centum of original section	36.4
Position of rupture	″.80 from neck
Character of broken surface	fine granular, with dull center
Elongation of inch sections	(″.25 fractured section), ″.13, ″.11, ″.10, ″.09, ″.08

No. 466.

Tension Test.

Marks on bar, $^{12}\frac{R\ B_2}{3}$
Diameter, ″.564.
Sectional area, .25 square inches.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10.000	.000233	.000150	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000717	.000150	0.	....	
7,500	30,000	.000900	.000183	0.	....	
8,750	35,000	.001067	.000167	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001250	.000017	....	....	
10,500	42,000	.001283	.000033	....	....	
10,750	43,000	.001317	.000034	....	....	
11,000	44,000	.001333	.000016	....	....	
11,250	45,000	.001383	.000050	0.	....	
11,500	46,000	.001433	.000050	....	....	
11,750	47,000	.001483	.000050	....	....	
12,000	48,000	.001500	.000017	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001583	.000050	0.	....	
12,750	51,000	.001650	.000067	....	....	
13,000	52,000	.001683	.000033	....	....	
13,250	53,000	.001733	.000050	....	....	
13,500	54,000	.001800	.000067	....	....	Elastic limit.
13,750	55,000	.002117	.000317	.000317	.000317	
14,000	56,000	.002883	.000766	....	....	
14.250	27,000	.003317	.000434	....	....	
14,500	58,000	.003883	.000566	....	....	
14.750	59,000	.004417	.000534	....	....	
15,000	60,000	.005117	.000700	.002917	.002600	
15,500	62,000	.006167	.001050	....	....	
16,000	64,000	.007500	.001333	....	....	
16,500	66,000	.008833	.001333	....	....	
17,000	68,000	.010500	.001667	....	....	
17,500	70,000	.011833	.001333	....	....	
18,000	72,000	.013500	.001667	....	....	
18,500	74,000	.015500	.002000	....	....	
19,000	76,000	.017167	.001667	....	....	
19,500	78,000	.018700	.001667	....	....	
20,000	80,000	.020167	.001467	....	....	
20,500	82,000	.022167	.002000	....	....	
21,000	84,000	.024000	.001833	....	....	
21,500	86,000	.026500	.002500	....	....	
22,000	88,000	.029167	.002667	....	....	
22,500	90,000	.031333	.002166	....	....	
23,000	92,000	.034333	.003000	....	....	
23,500	94,000	.037500	.003167	....	....	
24,000	96,000	.041167	.003667	....	....	
24,500	98,000	.046167	.005000	....	....	
25,000	100,000	.051500	.005333	....	....	
25,500	102,000	.0600	.0085	....	....	
26,000	104,000	.0733	.0133	....	....	
26,500	106,000	.0933	.0200	....	....	
26,690	106,760	.1217	.0284	....	....	Ultimate strength.
24,800	....	....	....	....	....	Load at time of rupture.

General Summary.

Tensile strength per square inch of original section	pounds..	106,760
Elastic limit per square inch of original section	do...	54,000
Elongation per inch after rupture	inch..	0.1400
Elongation per inch under strain at elastic limit	do....	.001800
Reduction in diameter at point of rupture	do....	.104
Reduction in area after rupture, per centum of original section	....	33.5
Position of rupture		1″.50 from neck
Character of broken surface		fine granular, with dull center
Elongation of inch sections		″.12, ″.28. ″.12, ″.11, ″.11, ″.1

No. 467.

Tension Test.

Marks on bar, $^{12}\text{R}_{4}\text{B}_{\text{x}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Irch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000083	.000083	0.	....	
2, 500	10, 000	.000250	.000167	0.	....	
8, 750	15, 000	.000400	.000150	0.	....	
5, 000	20, 000	.000567	.000167	0.	....	
6, 250	25, 000	.000717	.000150	0.	....	
7, 500	30, 000	.000900	.000183	0.	....	
8, 750	35, 000	.001067	.000167	0.	....	
10, 000	40, 000	.001233	.000166	0.	....	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001367	.000034	....	....	
11, 250	45, 000	.001400	.000033	0.	....	
11, 500	46, 000	.001433	.000033	....	....	
11, 750	47, 000	.001467	.000034	....	....	
12, 000	48, 000	.001500	.000033	....	....	
12, 250	49, 000	.001533	.000033	....	....	
12, 500	50, 000	.001600	.000067	0.	....	
12, 750	51, 000	.001633	.000033	....	....	
13, 000	52, 000	.001667	.000034	....	....	Elastic limit.
13, 250	53, 000	.001783	.000116	....	....	
13, 500	54, 000	.001983	.000100	....	....	
13, 750	55, 000	.002433	.000450	.000600	.000600	
14, 000	56, 000	.002933	.000500	....	....	
14, 250	57, 000	.003333	.000400	....	....	
14, 500	58, 000	.004033	.000700	....	....	
14, 750	59, 000	.004500	.000467	....	....	
15, 000	60, 000	.005250	.000750	.003050	.002450	
15, 500	62, 000	.006333	.001083	....	....	
16, 000	64, 000	.007833	.001500	....	....	
16, 500	66, 000	.009333	.001500	....	....	
17, 000	68, 000	.011000	.001667	....	....	
17, 500	70, 000	.013000	.002000	....	....	
18, 000	72, 000	.014333	.001333	....	....	
18, 500	74, 000	.015667	.001334	....	....	
19, 000	76, 000	.017500	.001833	....	....	
19, 500	78, 000	.019333	.001833	....	....	
20, 000	80, 000	.021167	.001834	....	....	
20, 500	82, 000	.023333	.002166	....	....	
21, 000	84, 000	.025667	.002334	....	....	
21, 500	86, 000	.028167	.002500	....	....	
22, 000	88, 000	.030667	.002500	....	....	
22, 500	90, 000	.032000	.001333	....	....	
23, 000	92, 000	.037000	.005000	....	....	
23, 500	94, 000	.041000	.004000	....	....	
24, 000	96, 000	.045000	.004000	....	....	
24, 500	98, 000	.050833	.005833	....	....	
25, 000	100, 000	.057333	.006500	....	....	
25, 500	102, 000	.069167	.011834	....	....	
26, 000	104, 000	.0867	.017533	....	....	
26, 320	105, 280	.1267	.0400	....	....	Ultimate strength.
24, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds.. 105, 280
Elastic limit per square inch of original section ....do.... 52, 000
Elongation per inch after rupture..inch.. 0. 1433
Elongation per inch under strain at elastic limit ....do.... .001667
Reduction in diameter at point of rupture ....do.... .114
Reduction in area after rupture, per centum of original section..do.... 36. 4
Position of rupture .... 1″.60 from neck
Character of broken surface ....fine granular, with dull center
Elongation of inch sections .... ″. 11 (″. 30 fractured section), ″. 14, ″. 11, ″. 10, ″. 10

No. 550.

Marks on bar, $^{12}\mathrm{R\,B}_{5}\,\mathrm{x\,I}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000367	.000250	0.	....	
3,750	15,000	.000533	.000166	0.	....	
5,000	20,000	.000700	.000167	0.	....	
6,250	25,000	.000917	.000217	0.	....	
7,500	30,000	.001100	.000183	0.	....	
8,750	35,000	.001283	.000183	0.	....	
10,000	40,000	.001483	.000200	0.	....	
10,250	41,000	.001517	.000034	....	....	
10,500	42,000	.001567	.000050	....	....	
10,750	43,000	.001600	.000033	....	....	
11,000	44,000	.001633	.000033	....	....	
11,250	45,000	.001683	.000050	0.	....	
11,500	46,000	.001733	.000050	....	....	
11,750	47,000	.001767	.000034	....	....	
12,000	48,000	.001817	.000050	....	....	
12,250	49,000	.001850	.000033	....	....	
12,500	50,000	.001883	.000033	0.	....	
12,750	51,000	.001950	.000067	....	....	Elastic limit.
13,000	52,000	.002050	.000100	....	....	
13,250	53,000	.002233	.000183	....	....	
13,500	54,000	.002667	.000434	....	....	
13,750	55,000	.003200	.000533	.000933	.000933	
14,000	56,000	.003883	.000683	....	....	
14,250	57,000	.004367	.000484	....	....	
14,500	58,000	.005033	.000066	....	....	
14,750	59,000	.005917	.000884	....	....	
15,000	60,000	.006917	.001000	.004150	.003217	
15,500	62,000	.008183	.001266	....	....	
16,000	64,000	.009833	.001650	....	....	
16,500	66,000	.011517	.001684	....	....	
17,000	68,000	.013200	.001683	....	....	
17,500	70,000	.014933	.001733	....	....	
18,000	72,000	.016717	.001784	....	....	
18,500	74,000	.018917	.002200	....	....	
19,000	76,000	.020833	.001916	....	....	
19,500	78,000	.023167	.002334	....	....	
20,000	80,000	.025500	.002333	....	....	
20,500	82,000	.028083	.002583	....	....	
21,000	84,000	.030700	.002617	....	....	
21,500	86,000	.033833	.003133	....	....	
22,000	88,000	.036950	.003117	....	....	
22,500	90,000	.041250	.004300	....	....	
23,000	92,000	.045883	.004633	....	....	
23,500	94,000	.054333	.008450	....	....	
24,000	96,000	.0600	.005667	....	....	
24,500	98,000	.0717	.0117	....	....	
25,000	100,000	.0883	.0166	....	....	
25,040	100,160	.1117	.0234	....	....	Tensile strength.
22,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,160
Elastic limit per square inch of original section	do....	51,000
Elongation per inch after rupture	inch..	0.1383
Elongation per inch under strain at elastic limit	do....	.001950
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		1″ from middle of stem
Character of broken surface		granular, dull center
Elongation of inch sections		″.12, ″.21, ″.26*, ″.10, ″.08, ″.06

No. 551.

Marks, $^{12\ R\ Bx\ O}_{\quad 6}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000300	.000233	0.	....	
3,750	15,000	.000483	.000183	0.	....	
5,000	20,000	.000683	.000200	0.	....	
6,250	25,000	.000850	.000167	—.000017	—.000017	
7,500	30,000	.001083	.000233	—.000017	0.	
8,750	35,000	.001283	.000200	—.000017	0.	
10,000	40,000	.001450	.000167	—.000033	—.000016	
10,250	41,000	.001467	.000017	....	....	
10,500	42,000	.001500	.000033	....	....	
10,750	43,000	.001533	.000033	....	....	
11,000	44,000	.001567	.000034	.....	....	
11,250	45,000	.001617	.000050	—.000033	0.	
11,500	46,000	.001683	.000066	....	....	
11,750	47,000	.001717	.000034	....	....	
12,000	48,000	.001783	.000066	....	....	
12,250	49,000	.001800	.000017	.....	....	
12,500	50,000	.001850	.000050	—.000033	0.	
12,750	51,000	.001883	.000033	....	....	
13,000	52,000	.001933	.000050	....	....	
13,250	53,000	.001967	.000034	....	....	Elastic limit.
13,500	54,000	.002050	.000083	....	....	
13,750	55,000	.002200	.000150	.000067	.000100	
14,000	56,000	.002667	.000467	....	....	
14,250	57,000	.003017	.000350	....	....	
14,500	58,000	.003633	.000616	....	....	
14,750	59,000	.003983	.000350	....	....	
15,000	60,000	.004667	.000684	.002033	.001966	
15,500	62,000	.006133	.001466	....	....	
16,000	64,000	.007417	.001284	....	....	
16,500	66,000	.009033	.001616	....	....	
17,000	68,000	.010783	.001750	....	....	
17,500	70,000	.012217	.001434	....	....	
18,000	72,000	.013967	.001750	....	....	
18,500	74,000	.015600	.001633	....	....	
19,000	76,000	.017333	.001733	....	....	
19,500	78,000	.019250	.001917	....	....	
20,000	80,000	.020867	.001617	....	....	
20,500	82,000	.023117	.002250	....	....	
21,000	84,000	.025683	.002566	....	....	
21,500	86,000	.028167	.002484	....	....	
22,000	88,000	.030867	.002700	....	....	
22,500	90,000	.033917	.003050	....	....	
23,000	92,000	.037083	.003166	....	....	
23,500	94,000	.041167	.004084	....	....	
24,000	96,000	.045000	.003833	....	....	
24,500	98,000	.051083	.006083	....	....	
25,000	100,000	.060000	.008917	....	....	
25,500	102,000	.0700	.0100	....	....	
26,000	104,000	.0883	.0183	....	....	
26,280	105,120	.1150	.0267	....	....	Tensile strength.
23,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds	105,120
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.1517
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		″.8 from middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch section		″.10, ″.14, ″.28*, ″.13, ″.14, ″.12

No. 438.

Compression Test.

Marks on bar, $^{12\,R\,B_1\,M}_{7}$
Length, 11″.958.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	0.	....	
10,000	10,000	.000240	.000120	0.	....	
15,000	15,000	.000410	.000170	0.	....	
20,000	20,000	.000580	.000170	0.	....	
25,000	25,000	.000740	.000160	0.	....	
30,000	30,000	.000890	.000150	0.	....	
31,000	31,000	.000930	.000040	....	....	
32,000	32,000	.000980	.000050	....	....	
33,000	33,000	.001010	.000030	....	....	
34,000	34,000	.001030	.000020	....	....	
35,000	35,000	.001070	.000040	0.	....	
36,000	36,000	.001100	.000030	....	....	
37,000	37,000	.001130	.000030	....	....	
38,000	38,000	.001160	.000030	....	....	
39,000	39,000	.001190	.000030	....	....	
40,000	40,000	.001220	.000030	0.	....	
41,000	41,000	.001270	.000050	....	....	
42,000	42,000	.001300	.000030	....	....	
43,000	43,010	.001330	.000030	....	....	
44,000	44,000	.001360	.000030	....	....	
45,000	45,000	.001390	.000030	0.	....	
46,000	46,000	.001440	.000050	....	....	
47,000	47,000	.001470	.000030	....	....	
48,000	48,000	.001530	.000060	....	....	
49,000	49,000	.001560	.000030	....	....	
50,000	50,000	.001580	.000020	0.	....	
51,000	51,000	.001620	.000040	....	....	
52,000	52,000	.001650	.000030	....	....	
53,000	53,000	.001680	.000030	....	....	
54,000	54,000	.001720	.000040	....	....	Elastic limit.
55,000	55,000	.001820	.000100	.000090	.000090	
56,000	56,000	.002620	.000800	....	....	
57,000	57,000	.003020	.000400	....	....	
58,000	58,000	.003350	.000330	....	....	
59,000	59,000	.004050	.000500	....	....	
60,000	60,000	.004560	.000510	.002630	.002540 *Deflection chord* 10″.	
61,000	61,000	.0050	.000440	....	.08	
62,000	62,000	.0055	.0005	....	.10	
63,000	63,000	.0060	.0005	....	.13	
64,000	64,000	.0080	.0020	....	.19	
65,000	65,000	.0090	.0010	....	.22	
65,460	65,460	.0100	.0010	....	.28	Ultimate strength.

General summary.

Elastic limit per square inch of original section ....pounds.. 54,000
Compression per inch under stress at elastic limit ....inch.. 0.001720
Ultimate strength per square inch of original section.................................pounds.. 65,460
Manner of failure ....triple flexure

Bent 150° when fracture occurred. Appearance, granular, radiating from a small dull spot in circumference at outside of bend.

No. 439.

Compression Test.

Marks on bar, $^{12\text{ R B}_1\text{ I}}_{8}$
Length, 11″.980.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000090	.000090	0.	....	
10,000	10,000	.000240	.000150	0.	....	
15,000	15,000	.000390	.000150	0.	....	
20,000	20,000	.000570	.000180	0.	....	
25,000	25,000	.000720	.000150	0.	....	
30,000	30,000	.000870	.000150	0.	....	
31,000	31,000	.000930	.000060	....	....	
32,000	32,000	.000960	.000030	....	....	
33,000	33,000	.000990	.000030	....	....	
34,000	34,000	.001020	.000030	....	....	
35,000	35,000	.001060	.000040	0.	....	
36,000	36,000	.001090	.000030	....	....	
37,000	37,000	.001120	.000040	....	....	
38,000	38,000	.001100	.000040	....	....	
39,000	39,000	.001190	.000030	....	....	
40,000	40,000	.001220	.000030	0.	....	
41,000	41,000	.001260	.000040	....	....	
42,000	42,000	.001290	.000030	....	....	
43,000	43,000	.001320	.000030	....	....	
44,000	44,000	.001360	.000040	....	....	
45,000	45,000	.001400	.000040	0.	....	
46,000	46,000	.001430	.000030	....	....	
47,000	47,000	.001470	.000040	....	....	
48,000	48,000	.001510	.000040	....	....	
49,000	49,000	.001540	.000030	....	....	
50,000	50,000	.001570	.000030	.000050	.000030	
51,000	51,000	.001600	.000030	....	....	
52,000	52,000	.001640	.000040	....	....	
53,000	53,000	.001680	.000040	....	....	
54,000	54,000	.001720	.000040	....	....	Elastic limit.
55,000	55,000	.001830	.000110	.000180	.000080	
56,000	56,000	.002380	.000550	....	....	
57,000	57,000	.002750	.000370	....	....	
58,000	58,000	.003380	.000630	....	....	
59,000	59,000	.004090	.000710	....	....	
60,000	60,000	.004700	.000610	.002780	.002650	
					Deflection cord 10″	
61,000	61,000	.0060	.0018	....	.12	
62,000	62,000	.0080	.0020	....	.14	
63,000	63,000	.0090	.0010	....	.18	
63,350	63,350	.0100	.0010	....	.21	Ultimate strength.

General summary.

Elastic limit, per square inch of original section	pounds..	54,000
Compression per inch under stress at elastic limit	inch..	0.001720
Ultimate strength, per square inch of original section	pounds..	63,350
Manner of failure		triple flexure

Bent 180° and ends closed down without fracture.

No. 444.

Compression Test.

Marks on bar, $12\ \mathrm{R}\ \underset{9}{\mathrm{B}}\ \mathrm{x}\ \mathrm{R}$
Length, 4″.11.
Diameter, ″.423.
Sectional area, .141 square inch.
Ultimate strength, 9,860 pounds=69,930 pounds per square inch.
Failed by triple flexure.
Bent 108°, then fractured. Small dull spot on the tension side of the bend; balance fine granular appearance.

No. 445.

Compression Test.

Marks on bar, $12\ \mathrm{R}\ \underset{10}{\mathrm{B}}\ \mathrm{x}\ \mathrm{R}$
Length, 4″.16.
Diameter, ″.425.
Sectional area, .142 square inch.
Ultimate strength, 9,410 pounds=66,270 pounds per square inch.
Failed by triple flexure.
Bent 115°, then fractured. Dull, smoky spot at circumference on the tension side of bend; otherwise granular.

No. 569.

Marks, $^{12\,\mathrm{R\,B_2\,I}}_{11}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000283	.000183	0.	....	
3,750	15,000	.000417	.000134	0.	....	
5,000	20,000	.000600	.000183	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000933	.000200	0.	....	
8,750	35,000	.001100	.000167	0.	....	
10,000	40,000	.001267	.000167	0.	....	
10,250	41,000	.001283	.000016	....	....	
10,500	42,000	.001300	.000017	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001383	.000050	....	....	
11,250	45,000	.001417	.000034	0.	....	
11,500	46,000	.001450	.000033	....	....	
11,750	47,000	.001483	.000033	....	....	
12,000	48,000	.001533	.000050	....	....	
12,250	49,000	.001567	.000034	....	....	
12,500	50,000	.001633	.000066	0.	....	
12,750	51,000	.001683	.000050	....	....	
13,000	52,000	.001750	.000067	....	....	Elastic limit.
13,250	53,000	.003050	.001300	....	....	
13,500	54,000	.003833	.000783	....	....	
13,750	55,000	.004500	.000667	.002467	.002467	
14,000	56,000	.005300	.000800	....	....	
14,250	57,000	.005683	.000383	....	....	
14,500	58,000	.006367	.000684	....	....	
14,750	59,000	.007000	.000633	....	....	
15,000	60,000	.007800	.000800	.005533	.003066	
15,500	62,000	.009467	.001667	....	....	
16,000	64,000	.011167	.001700	....	....	
16,500	66,000	.012667	.001500	....	....	
17,000	68,000	.014533	.001866	....	....	
17,500	70,000	.016133	.001600	....	....	
18,000	72,000	.018017	.001884	....	....	
18,500	74,000	.020300	.002283	....	....	
19,000	76,000	.022533	.002233	....	....	
19,500	78,000	.024550	.002017	....	....	
20,000	80,000	.026833	.002283	....	....	
20,500	82,000	.029583	.002750	....	....	
21,000	84,000	.032450	.002867	....	....	
21,500	86,000	.035800	.003350	....	....	
22,000	88,000	.039167	.003367	....	....	
22,500	90,000	.043833	.004066	....	....	
23,000	92,000	.048333	.004500	....	....	
23,500	94,000	.054167	.005834	....	....	
24,000	96,000	.064000	.009833	....	....	
24,500	98,000	.0767	.0127	....	....	
25,000	100,000	.0983	.0216	....	....	
25,070	100,280	.1300	.0317	....	....	Tensile strength.
22,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,280
Elastic limit per square inch of original section	do .	52,000
Elongation per inch after rupture	inch..	0.1650
Elongation per inch under strain at elastic limit	do ...	.001750
Reduction in diameter at point of rupture	do....	124
Reduction in area after rupture, per centum of original section	..	39.2
Position of rupture		″.6 from middle of stem
Character of broken surface		40 per cent. fine, granular, crescent-shaped; 60 per cent. dull, smoky
Elongation of inch sections		″.09, ″.12, ″.10, ″.34*, ″.17, ″.11

No. 570.

Marks, $^{12\,R\,B_x\,O}_{\quad 12}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000233	.000133	—.000017	—.000017	
3,750	15,000	.000383	.000150	—.000033	—.000016	
5,000	20,000	.000550	.000167	—.000033	0.	
6,250	25,000	.000700	.000150	—.000033	0.	
7,500	30,000	.000867	.000167	—.000033	0.	
8,750	35,000	.001033	.000166	—.000033	0.	
10,000	40,000	.001200	.000167	—.000033	0.	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001317	.000017	....	....	
11,250	45,000	.001367	.000050	—.000033	0.	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001517	.000050	....	....	
12,500	50,000	.001550	.000033	—.000033	0.	
12,750	51,000	.001583	.000033	....	....	
13,000	52,000	.001617	.000034	....	....	
13,250	53,000	.001650	.000033	....	....	
13,500	54,000	.001717	.000067	....	....	Elastic limit.
13,750	55,000	.001867	.000150	.000067	.000100	
14,000	56,000	.002617	.000750	....	....	
14,250	57,000	.003350	.000733	....	....	
14,500	58,000	.004117	.000700	....	....	
14,750	59,000	.004783	.000666	....	....	
15,000	60,000	.005517	.000734	.003217	.003150	
15,500	62,000	.006583	.001066	....	....	
16,000	64,000	.007867	.001284	....	....	
16,500	66,000	.009633	.001766	....	....	
17,000	68,000	.011167	.001534	....	....	
17,500	70,000	.012583	.001416	....	....	
18,000	72,000	.014367	.001784	....	....	
18,500	74,000	.016000	.001633	....	....	
19,000	76,000	.017617	.001617	....	....	
19,500	78,000	.019333	.001716	....	....	
20,000	80,000	.021383	.002050	....	....	
20,500	82,000	.023500	.002117	....	....	
21,000	84,000	.026000	.002500	....	....	
21,500	86,000	.028167	.002167	....	....	
22,000	88,000	.030867	.002700	....	....	
22,500	90,000	.033833	.002966	....	....	
23,000	92,000	.036917	.003084	....	....	
23,500	94,000	.040667	.003750	....	....	
24,000	96,000	.045200	.004533	....	....	
24,500	98,000	.050700	.005500	....	....	
25,000	100,000	.057267	.006567	....	....	
25,500	102,000	.0683	.011033	....	....	
26,000	104,000	.0833	.0150	....	....	
26,190	104,760	.1083	.0250	....	....	Tensile strength.
23,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	104,760
Elastic limit per square inch of original section	do....	54,000
Elongation per inch after rupture	inch..	0.1367
Elongation per inch under strain at elastic limit	do...	.001717
Reduction in diameter at point of rupture	do...	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		1″ from neck
Character of broken surface		fine. granular; dull center
Elongation of inch sections		″.24, ″.17, ″.12, ″.11, ″.09, ″.09

No. 571.

Marks, $^{12\ R\ B_2\ I}_{13}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation. per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000233	.000133	— .000017	— .000017	
3, 750	15, 000	.000417	.000184	— .000017	0.	
5, 000	20, 000	.000583	.000166	— .000033	— .000016	
6, 250	25, 000	.000733	.000150	— .000033	0.	
7, 500	30, 000	.000900	.000167	— .000033	0.	
8, 750	35, 000	.001067	.000167	— .000033	0.	
10, 000	40, 000	.001233	.000166	— .000033	0.	
10, 250	41, 000	.001267	.000034	....	....	
10, 500	42, 000	.001300	.000033	....	....	
10, 750	43, 000	.001333	.000033	....	....	
11, 000	44, 000	.001367	.000034	....	....	
11, 250	45, 000	.001400	.000033	0.	.000033	
11, 500	46, 000	.001450	.000050	....	....	
11, 750	47, 000	.001483	.000033	....	....	
12, 000	48, 000	.001550	.000067	....	....	Elastic limit.
12, 250	49, 000	.001683	.000133	....	....	
12, 500	50, 000	.002550	.000867	.000850	.000850	
12, 750	51, 000	.003217	.000667	....	....	
13, 000	52, 000	.003833	.000616	....	....	
13, 250	53, 000	.004367	.000534	....	....	
13, 500	54, 000	.005200	.000833	....	....	
14, 750	55, 000	.005850	.000650	.003800	.002950	
14, 000	56, 000	.006833	.000983	....	....	
14, 250	57, 000	.007367	.000734	....	....	
14, 500	58, 000	.008183	.000816	....	....	
14, 750	59, 000	.008800	.000617	....	....	
15, 000	60, 000	.009967	.001167	.007600	.003800	
15, 500	62, 000	.011400	.001433	....	....	
16, 000	64, 000	.012917	.001517	....	....	
16, 500	66, 000	.014600	.001683	....	....	
17, 000	68, 000	.016833	.002233	....	....	
17, 500	70, 000	.018667	.001834	....	....	
18, 000	72, 000	.020767	.002100	....	....	
18, 500	74, 000	.023033	.002266	....	....	
19, 000	76, 000	.025417	.002384	....	....	
19, 500	78, 000	.027167	.001750	....	....	
20, 000	80, 000	.031083	.003916	....	....	
20, 500	82, 000	.034333	.003250	....	....	
21, 000	84, 000	.037883	.003550	....	....	
21, 500	86, 000	.041867	.003984	....	....	
22, 000	88, 000	.046667	.004800	....	....	
22, 500	90, 000	.052833	.006166	....	....	
23, 000	92, 000	.0600	.007167	....	....	
23, 500	94, 000	.0750	.0150	....	....	
24, 000	96, 000	.0933	.0183	....	....	
24, 200	96, 800	.1233	.0300	....	....	Tensile strength.
21, 200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength, per square inch of original section..........pounds.. 96, 800
Elastic limit, per square inch of original section..........do.... 48, 000
Elongation per inch after rupture..........inch.. 0. 1617
Elongation per inch under strain at elastic limit..........do.... .001550
Reduction in diameter at point of rupture..........do.... .134
Reduction in area after rupture, per centum of original section.......... 41. 9
Position of rupture..........″.40 from middle of stem
Character of broken surface..........dull smoky center, granular at circumference
Elongation of inch sections.......... ″.10, ″.14, ″.33*, ″.15, ″.11, ″.09

No. 572.

Marks, $^{12\,R\,B_2\,O}_{14}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

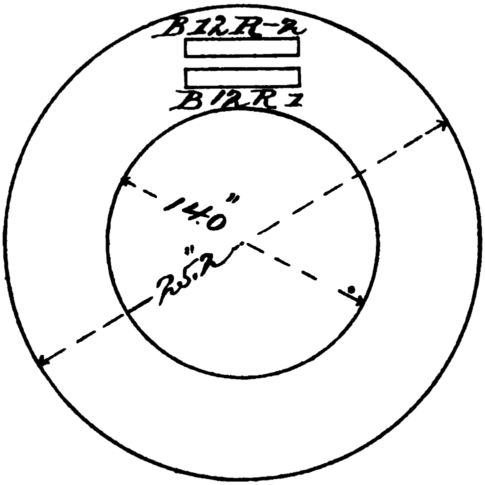
Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000133	.000133	0.	....	
2, 500	10, 000	.000283	.000150	0.	....	
3, 750	15, 000	.000433	.000150	0.	....	
5, 000	20, 000	.000617	.000184	0.	....	
6, 250	25, 000	.000767	.000150	0.	....	
7, 500	30, 000	.000933	.000166	0.	....	
8, 750	35, 000	.001100	.000167	0.	....	
10, 000	40, 000	.001283	.000183	0.	....	
10, 250	41, 000	.001300	.000017	....	....	
10, 500	42, 000	.061350	.000050	....	....	
10, 750	43, 000	.001383	.000033	....	....	
11, 000	44, 000	.001450	.000067	....	....	
11, 250	45, 000	.001467	.000017	0.	....	
11, 500	46, 000	.001517	.000050	....	....	
11, 750	47, 000	.001533	.000016	....	....	
12, 000	48, 000	.001567	.000034	....	....	
12, 250	49, 000	.001600	.000033	....	....	
12, 500	50, 000	.001650	.000050	.000033	.000033	
12, 750	51, 000	.001683	.000033	....	....	
13, 000	52, 000	.001800	.000117	....	....	
13, 250	53, 000	.001867	.000067	....	....	Elastic limit.
13, 500	54, 000	.002417	.000550	....	....	
13, 750	55, 000	.003267	.000850	.001300	.001267	
14, 000	56, 000	.004133	.000866	....	....	
14, 250	57, 000	.004400	.000267	....	....	
14, 500	58, 000	.005083	.000683	....	....	
14, 750	59, 000	.005867	.000784	....	....	
15, 000	60, 000	.006550	.000683	.004350	.003050	
15, 500	62, 000	.007667	.001117	....	....	
16, 000	64, 000	.009417	.001750	....	....	
16, 500	66, 000	.010833	.001416	....	....	
17, 000	68, 000	.012633	.001800	....	....	
17, 500	70, 000	.014133	.001500	....	....	
18, 000	72, 000	.015917	.001784	....	....	
18, 500	74, 000	.017667	.001750	....	....	
19, 000	76, 000	.019467	.001800	....	....	
19, 500	78, 000	.021667	.002200	....	....	
20, 000	80, 000	.023750	.002083	....	....	
20, 500	82, 000	.026133	.002383	....	....	
21, 000	84, 000	.028667	.002534	....	....	
21, 500	86, 000	.031167	.002500	....	....	
22, 000	88, 000	.034200	.003033	....	....	
22, 500	90, 000	.038167	.003967	....	....	
23, 000	92, 000	.041867	.003700	....	....	
23, 500	94, 000	.046000	.004133	....	....	
24, 000	96, 000	.052167	.006167	....	....	
24, 500	98, 000	.059167	.007000	....	....	
25, 000	100, 000	.0683	.009133	....	....	
25, 500	102, 000	.0883	.0200	....	....	
25, 760	103, 040	.1200	.0317	....	....	Tensile strength.
22, 800	....	....	....	....	....	Load at time of rupture

General summary.

Tensile strength per square inch of original section	pounds..	103, 040
Elastic limit per square inch of original section	do....	53, 000
Elongation per inch after rupture	inch..	0. 1517
Elongation per inch under strain at elastic limit	do....	.001867
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		1″.10 from neck
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.27, ″.22, ″.13, ″.11, ″.10, ″.08

12" B.L. Rifle
Cast Iron Body
Hooped and Tubed with Steel.

Breech Bushing



No. 493.

Tension Test.

Marks on bar, $^{B\ 12\ R}_{\ \ \ 1}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000300	.000133	0.	....	
3,750	15,000	.000433	.000133	0.	....	
5,000	20,000	.000567	.000134	0.	....	
6,250	25,000	.000700	.000133	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001000	.000100	0.	....	
10,000	40,000	.001167	.000167	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001500	.000033	0.	....	
12,750	51,000	.001533	.000033	....	....	
13,000	52,000	.001633	.000100	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	
13,750	55,000	.001767	.000067	.000067	.000067	Elastic limit.
14,000	56,000	.001933	.000166	....	....	
14,250	57,000	.002167	.000234	....	....	
14,500	58,000	.002433	.000266	....	....	
14,750	59,000	.002767	.000334	....	....	
15,000	60,000	.003800	.001033	.001733	.001666	
15,500	62,000	.005267	.001467	....	....	
16,000	64,000	.006500	.001233	....	....	
16,500	66,000	.008433	.001933	....	....	
17,000	68,000	.010167	.001734	....	....	
17,500	70,000	.011833	.001666	....	....	
18,000	72,000	.013700	.001867	....	....	
18,500	74,000	.015600	.001900	....	....	
19,000	76,000	.017600	.002000	....	....	
19,500	78,000	.019733	.002133	....	....	
20,000	80,000	.021433	.001700	....	....	
20,500	82,000	.024267	.002834	....	....	
21,000	84,000	.026600	.002333	....	....	
21,500	86,000	.029333	.002733	....	....	
22,000	88,000	.032967	.003634	....	....	
22,500	90,000	.036000	.003033	....	....	
23,000	92,000	.040000	.004000	....	....	
23,500	94,000	.045000	.005000	....	....	
24,000	96,000	.050833	.005833	....	....	
24,500	98,000	.056900	.006067	....	....	
25,000	100,000	.070333	.013433	....	....	
25,500	102,000	.0967	.026367	....	....	
25,700	102,800	.1333	.0366	....	....	Ultimate strength.
23,800	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8558
Hardness		21.89
Tensile strength per square inch of original section	pounds..	102,800
Elastic limit per square inch of original section	do ...	55,000
Elongation per inch after rupture	inch..	0.1867
Elongation per inch under strain at elastic limit	do....	.001767
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		at middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.13 (″.31 fractured section), ″.12

No. 494.

Tension Test.

Marks on bar, B $\overset{12}{\underset{2}{}}$ R
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000167	.000167	0.	....	
2, 500	10, 000	.000367	.000200	0.	....	
3, 750	15, 000	.000567	.000200	0.	....	
5, 000	20, 000	.000733	.000166	0.	....	
6, 250	25, 000	.000900	.000167	0.	....	
7, 500	30, 000	.001033	.000133	.000033	.000033	
8, 750	35, 000	.001233	.000200	.000033	0.	
10, 000	40, 000	.001333	.000100	.000067	.000034	
10, 250	41, 000	.001333	0.	....	....	
10, 500	42, 000	.001367	.000034	....	....	
10, 750	43, 000	.001400	.000033	....	....	
11, 000	44, 000	.001433	.000033	....	....	
11, 250	45, 000	.001467	.000034	.000067	0.	
11, 500	46, 000	.001533	.000066	....	....	
11, 750	47, 000	.001567	.000034	....	....	
12, 000	48, 000	.001633	.000066	....	....	
12, 250	49, 000	.001667	.000034	....	....	
12, 500	50, 000	.001700	.000033	.000100	.000033	
12, 750	51, 000	.001700	0.	....	....	
13, 000	52, 000	.001733	.000033	....	....	
13, 250	53, 000	.001767	.000034	....	....	
13, 500	54, 000	.001867	.000100	....	....	
13, 750	55, 000	.001933	.000066	.000200	.000100	
14, 000	56, 000	.002067	.000134	....	....	
14, 250	57, 000	.002167	.000100	....	....	Elastic limit.
14, 500	58, 000	.002400	.000233	....	....	
14, 750	59, 000	.002633	.000233	....	....	
15, 000	60, 000	.003400	.000767	.001367	.001167	
15, 500	62, 000	.004767	.001367	....	....	
16, 000	64, 000	.006067	.001300	....	....	
16, 500	66, 000	.008100	.002033	....	....	
17, 000	68, 000	.010167	.002067	....	....	
17, 500	70, 000	.011733	.001566	....	....	
18, 000	72, 000	.013733	.002000	....	....	
18, 500	74, 000	.015733	.002000	....	....	
19, 000	76, 000	.017667	.001934	....	....	
19, 500	78, 000	.019733	.002066	....	....	
20, 000	80, 000	.021933	.002200	....	....	
20, 500	82, 000	.024267	.002334	....	....	
21, 000	84, 000	.026667	.002400	....	....	
21, 500	86, 000	.029733	.003066	....	....	
22, 000	88, 000	.032900	.003167	....	....	
22, 500	90, 000	.036367	.003467	....	....	
23, 000	92, 000	.040433	.004066	....	....	
23, 500	94, 000	.045400	.004967	....	....	
24, 000	96, 000	.051667	.006267	....	....	
24, 500	98, 000	.059000	.007333	....	....	
25, 000	100, 000	.073000	.014000	....	....	
25, 500	102, 000	.0967	.0237	....	....	
25, 620	102, 480	.1400	.0433	....	....	Ultimate strength.
22, 900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	102, 480
Elastic limit per square inch of original section	do....	57, 000
Elongation per inch after rupture	inch..	0. 1933
Elongation per inch under strain at elastic limit	do....	.002167
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39. 2
Position of rupture		″.30 from middle of stem
Character of broken surface		fine granular, dull center
Elongation of inch sections		″.12 (″.31 fractured section), ″.15

TABULATION OF TENSION SPECIMENS FROM 12" B. L. RIFLE, CAST-IRON BODY, HOOPED AND TUBED WITH STEEL.

No. of test.	Position in gun.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
625	Breech of cast-iron body	Tangential 1		23,790			Coarse granular		
626	do	Tangential 2		26,000			do		
590	Muzzle of cast-iron body	Tangential 1		26,400			do		15.99
	do	Tangential 2		26,980			do		
682½	Steel tube (Whitworth)	Outside 1	54,000	94,720	21.7	39.2	Silky, 60 per cent.; granular, 40 per cent.	7.8658	18.09
683	do	Inside 2	56,000	101,880	11.0	21.4	Granular; rough, spongy center		
684	do	Middle 3	50,000	92,200	19.7	27.6	Granular, 70 per cent.; dull spongy, 30 per cent.		
685	do	Radial 4	41,000	91,520	10.5	15.0	Granular		
686	do	Radial 5	41,000	92,480	12.5	21.4	Granular, 45 per cent.; dull spongy, 55 per cent.		
472	Steel hoop A_8	Middle 1	57,000	107,600	14.2	36.4	Fine granular; dull center	7.8547	23.08
473	do	Middle 2	55,000	104,480	14.8	36.4	do		
474	do	Middle 3	55,000	106,400	12.7	33.5	do		
475	do	Middle 4	57,000	104,560	14.7	39.2	do		
540	do	Inside 5	65,000	111,800	13.3	41.9	do		
541	do	Outside 6	57,000	106,240	14.8	36.4	do		
468	Steel hoop A_8	Middle 1	54,000	105,600	13.8	30.6	do	7.8538	22.37
469	do	Middle 2	53,000	104,200	16.2	33.5	do		
470	do	Middle 3	50,000	101,200	17.0	36.4	do		
471	do	Middle 4	49,000	101,280	15.2	33.5	do		
472	do	Inside 5	52,000	104,400	14.3	33.5	do		
543	do	Outside 6	53,000	102,000	13.8	36.4	do		
577	Steel hoop A_{11}	Inside 1	59,000	107,040	13.5	36.4	do	7.8482	23.17
578	do	Outside 2	61,000	109,280	14.5	36.4	do		
579	do	Inside 3	60,000	107,200	15.0	39.2	do		
580	do	Outside 4	59,000	107,120	15.0	36.4	do		
711	do	Inside 5	53,000	107,840	10.5	24.6	Granular		
712	do	Outside 6	53,000	107,240	11.2	24.6	Granular, small dull spot		
713	do	Middle 7	47,000	103,440	11.2	27.6	do		
821	New hoop A_{11} to take place of one above, rejected.	Inside 8	43,000	99,920	14.7	41.9	Dull silky	7.8505	18.09
822	do	Outside 9	47,000	98,880	13.3	41.9	Silky, 60 per cent.; granular, 40 per cent.		
823	do	Middle 10	49,000	102,560	13.3	36.4	do ... do		

TABULATION OF TENSION SPECIMENS FROM 12″ B. L. RIFLE, CAST-IRON BODY, &c.—Continued.

No. of test.	Position in gun.	Location of specimen.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation.	Contraction of area.	Appearance of fracture.	Specific gravity.	Hardness.
			Pounds.	*Pounds.*	*Per cent.*	*Per cent.*			
544	Steel hoop A_{13}	Inside 1	84,000	88,600	18.8	39.2	Dull spongy and granular	7.8575	14.90
545	......do	Outside 2	87,000	88,000	20.5	33.5	......do		
714	Steel hoop A_{13} after tempering and annealing.	Inside 3	55,600	101,660	12.5	33.5	Granular, dull center	7.8632	19.81
715	......do	Outside 4	55,000	107,160	12.8	30.6	Granular, small spongy spot		
716	......do	Middle 5	53,000	102,400	13.7	33.5	Granular, dull center		
460	Steel hoop A_2	Outside 1	48,600	100,240	15.7	39.2	Fine granular, dull center	7.8543	19.81
461	......do	Inside 2	49,000	101,000	15.7	39.2	......do		
462	......do	Inside 3	50,000	102,280	15.0	36.4	......do		
463	......do	Outside 4	49,000	100,000	16.2	39.2	......do		
567	......do	Inside 5	48,000	102,280	16.7	33.5	......do		
568	......do	Outside 6	49,000	100,640	14.3	36.4	......do		
664	......do	Inside 7	52,000	107,920	12.7	27.6	Granular, dull center		
665	......do	Outside 8	53,000	106,000	13.2	30.6	......do		
666	......do	Middle 9	50,000	106,160	15.5	30.6	......do		
667	......do	Middle 10	49,600	105,600	14.3	30.6	......do		
476	Steel hoop B_1	Middle 1	54,600	109,280	12.2	30.6	Fine granular, dull center	7.8568	22.64
477	......do	Middle 2	51,000	101,160	14.8	36.4	......do		
478	......do	....do	55,600	108,200	12.8	30.6	......do		
479	......do	Middle 4	48,000	98,060	14.8	41.9	Dull, spongy and granular		
546	......do	Inside 5	64,000	114,600	10.2	27.6	Fine granular, dull center		
547	......do	Outside 6	54,000	102,000	14.5	41.9	Dull, spongy and granular		
534	Steel hoop B_5	Inside 1	59,000	109,560	15.8	39.2	Silky and fine granular	7.8481	23.70
535	......do	Outside 2	61,000	109,160	16.0	41.9	......do		
536	......do	Inside 3	58,000	108,200	15.5	39.2	......do		
537	......do	Outside 4	60,000	108,640	15.3	41.9	......do		
585	......do	Middle 5	61,000	112,000	13.3	33.4	Fine granular, dull center		
586	......do	Middle 6	59,000	109,440	14.5	39.2	Dull smoky and granular		
581	Steel hoop B_9	Inside 1	53,000	102,280	14.2	41.9	Dull, spongy and granular	7.8511	22.14
582	......do	Outside 2	54,000	104,080	15.2	36.4	Fine granular, dull center		
583	......do	Inside 3	53,000	102,200	14.8	39.2	Dull spongy and granular		
584	......do	Outside 4	53,000	102,240	16.8	39.2	......do		

480	Steel hoop B_{11}	Middle 1	54,000	101,200	16.0	39.2	Fine granular, dull center	7.8564	21.64
481	do	Middle 2	55,000	104,400	13.8	33.5	do		
482	do	Middle 3	53,000	102,480	14.5	36.4	do		
483	do	Middle 4	53,000	101,840	14.8	36.4	do		
548	do	Inside 5	58,000	107,000	14.8	33.5	do		
549	do	Outside 6	57,000	106,000	15.8	33.5	do		
464	Steel hoop B_2	Middle 1	54,000	104,320	18.8	36.4	do	7.8581	20.36
465	do	Middle 2	53,600	104,000	12.7	36.4	do		
466	do	Middle 3	54,000	106,760	14.0	33.5	do		
467	do	Middle 4	52,000	105,280	14.8	36.4	do		
550	do	Inside 5	51,000	100,160	13.8	39.2	Granular, dull center		
551	do	Outside 6	53,000	105,120	15.2	33.5	Fine granular, dull center		
569	do	Inside 11	52,000	100,280	16.5	39.2	Dull smoky, 60 per cent.; fine granular, 40 per cent.		
570	do	Outside 12	54,000	104,760	18.7	36.4	Fine granular, dull center		
571	do	Inside 13	48,000	96,800	16.2	41.9	Dull, smoky and granular		
572	do	Outside 14	53,000	103,040	15.2	39.2	Fine granular, dull center		
493	Steel breech bushing	Middle 1	55,000	102,800	18.7	36.4	do	7.8558	21.89
494	do	Middle 2	57,000	102,480	19.8	39.2	do		

Marks, $12''\,\overset{\text{B R}}{\text{H \& T}}$

Number of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Sq. inch.*	*Pounds.*	*Pounds.*	
611	9	1.129	1.00	32,990	32,990	Coarse granular.
612	10	1.129	1.00	29,700	29,700	Do.
613	11	1.129	1.00	34,000	34,000	Do.
614	12	1.129	1.00	32,750	32,750	Do.
615	13	1.129	1.00	32,040	32,040	Do.
616	*14	1.129	1.00	31,000	31,000	Do.
617	15	1.129	1.00	31,090	31,090	Do.
618	16	1.129	1.00	25,700	25,700	Do.
619	17	1.129	1.00	31,550	31,550	Do.
620	18	1.129	1.00	31,580	31,580	Do.
621	19	1.129	1.00	33,850	33,830	Do.

* Hardness of No. 14—14.69.

Marks, $12''\,\overset{\text{M R}}{\text{H \& T}}$

Number of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Sq. inch.*	*Pounds.*	*Pounds.*	
597	9	1.129	1.00	33,380	33,380	Coarse granular.
598	10	1.129	1.00	39,210	39,210	Fine granular.
560	11	1.129	1.00	32,820	32,820	Granular, light gray color.
561	12	1.129	1.00	39,100	39,100	Granular, light gray color; specific gravity, 7.3426; hardness, 17.17.
562	13	1.129	1.00	32,230	32,230	Granular, light gray color.
599	14	1.129	1.00	32,390	32,390	Coarse granular.
600	15	1.129	1.00	40,675	40,675	Fine granular.
601	16	1.129	1.00	33,420	33,420	Coarse granular.
602	17	1.129	1.00	34,130	34,130	Do.
603	18	1.129	1.00	39,400	39,400	Fine granular.
604	19	1.129	1.00	34,810	34,810	Coarse granular.

TABULATION OF COMPRESSION SPECIMENS FROM 12″ B. L. RIFLE, CAST-IRON BODY, HOOPED AND TUBED WITH STEEL.

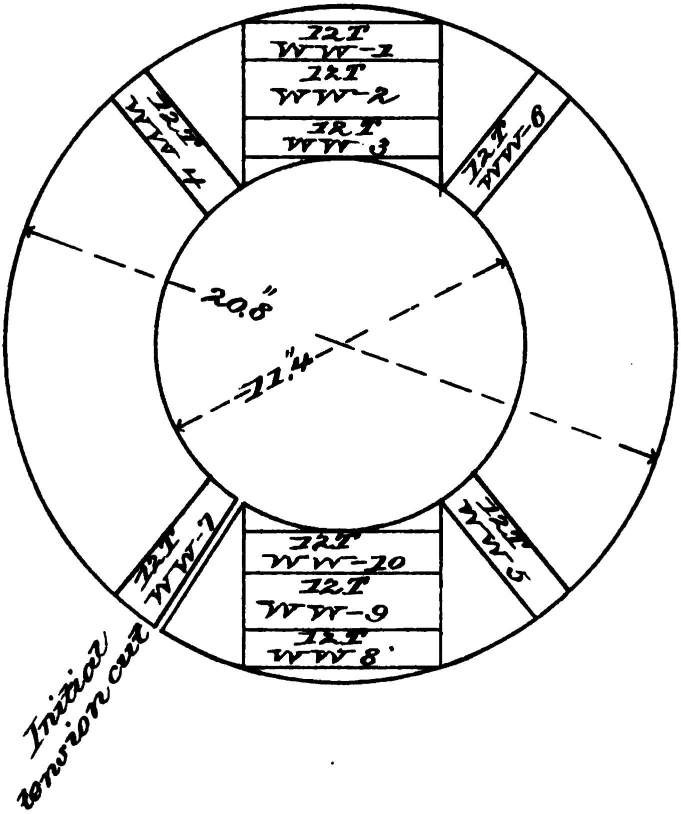
Number of test.	Position in gun.	Location of specimen.	Length.	Diameter.	Sectional area.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.	Remarks.
			Inch.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*		
491	Breech of cast-iron body	Outside 3	12.00	1.129	1.00	....	52,080	Triple flexure	
492	do	Inside 4	12.00	1.129	1.00	....	50,000	do	
493	do	Inside 5	12.00	1.129	1.00	....	48,660	do	
494	do	Outside 6	12.00	1.129	1.00	....	52,000	do	
495	do	Radial 7	12.00	1.129	1.00	....	50,490	do	Specific gravity, 7.3080.
496	do	Radial 8	12.00	1.129	1.00	....	50,720	do	
480	Muzzle of cast-iron body	Outside 3	12.00	1.129	1.00	....	52,100	do	
481		Inside 4	12.00	1.129	1.00	....	52,020	do	
482		Inside 5	12.00	1.129	1.00	....	52,700	do	
483		Outside 6	12.00	1.129	1.00	....	52,300	do	
484		Radial 7	12.00	1.129	1.00	....	53,000	do	
485		Radial 8	12.00	1.129	1.00	....	54,800	do	
514	Steel tube (Whitworth)	Outside 6	5.00	.797	.50	48,000	88,620	do	
515		Inside 7	5.00	.797	.50	54,000	69,580	do	
516		Middle 8	5.00	.797	.50	46,000	83,020	do	
517		Radial 9	4.25	.797	.50	50,000	102,100	do	
518		Radial 10	4.25	.797	.50	51,000	104,340	do	
437	Steel hoops, A_8	Middle 7	11.992	1.129	1.00	58,000	65,250	do	
443		Radial 8	3.54	0.367	0.106	....	73,020	do	Bent 130°, then fractured.
440	Steel hoops, B_{11}	Outside 7	12.00	1.129	1.00	54,000	63,200	do	
446	do	Radial 8	3.51	0.362	0.103	....	68,450	do	Bent 155°, then fractured.
438	Steel hoops, Bx	Middle 7	11.958	1.129	1.00	54,000	65,460	do	Bent 150°, then fractured.
439	do	Inside 8	11.960	1.129	1.00	54,000	63,350	do	Bent 180°, and closed down without fracture.
444	do	Radial 9	4.11	0.423	0.141	....	69,930	do	Bent 180°, then fractured.
445	do	Radial 10	4.16	0.425	1.142	....	66,270	do	Bent 115°, then fractured.

8.—12″ CAST-IRON B. L. RIFLE, LINED WITH WIRE-WRAPPED STEEL TUBE.

[Specimens from slice cut from steel tube, Whitworth manufacture.]

12" Cast Iron B.L. Rifle

Lined with wire-wrapped Steel tube



S Ex 36 49 1

No. 659.

Marks, $\frac{12''\ \mathrm{T}}{\mathrm{W\ W\ 1}}$
Diameter, ''.564.
Sectional area, .25 square inch.
Length, 3''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000500	.000133	0.	....	
6,250	25,000	.000667	.000167	0.	....	
7,500	30,000	.000833	.000166	0.	....	
8,750	35,000	.001000	.000167	0.	....	
10,000	40,000	.001167	.000167	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001433	0.	....	....	
12,500	50,000	.001467	.000034	0.	....	Elastic limit.
12,750	51,000	.001667	.000200	....	....	
13,000	52,000	.002100	.000433	....	....	
13,250	53,000	.003067	.000967	....	....	
13,500	54,000	.003833	.000766	....	....	
13,750	55,000	.004433	.000600	.002433	.002433	
14,000	56,000	.004900	.000467	....	....	
14,250	57,000	.005400	.000500	....	....	
14,500	58,000	.005933	.000533	....	....	
14,750	59,000	.006600	.000667	....	....	
15,000	60,000	.007433	.000833	.005267	.002834	
15,500	62,000	.008767	.001334	....	....	
16,000	64,000	.010233	.001466	....	....	
16,500	66,000	.011933	.001700	....	....	
17,000	68,000	.013567	.001634	....	....	
17,500	70,000	.015433	.001866	....	....	
18,000	72,000	.017167	.001734	....	....	
18,500	74,000	.019033	.001866	....	....	
19,000	76,000	.021233	.002200	....	....	
19,500	78,000	.023267	.002034	....	....	
20,000	80,000	.025667	.002400	....	....	
20,500	82,000	.028333	.002666	....	....	
21,000	84,000	.030933	.002600	....	....	
21,500	86,000	.037500	.006567	....	....	
22,000	88,000	.038100	.000600	....	....	
22,500	90,000	.042167	.004067	....	....	
23,000	92,000	.048400	.006233	....	....	
23,500	94,000	.054267	.005867	....	....	
24,000	96,000	.063333	.009066	....	....	
24,500	98,000	.0767	.013367	....	....	
25,000	100,000	.1067	.0300	....	....	
25,040	100,160	.1267	.0200	....	....	Tensile strength.
22,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	100,160
Elastic limit per square inch of original section	do....	50,000
Elongation per inch after rupture	inch..	0.1867
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		''.45 from middle of stem
Character of broken surface		fine granulated, dull center
Elongation of inch sections		''.16, ''.29*, ''.11

No. 660.

Marks, $\overset{12''\ \mathrm{T}}{\mathrm{W\ W}_2}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 3".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000300	.000200	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000600	.000200	0.	....	
6,250	25,000	.000733	.000133	0.	....	
7,500	30,000	.000867	.000134	0.	....	
8,750	35,000	.001067	.000200	0.	....	
10,000	40,000	.001233	.000166	0.	....	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001267	0.	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	Elastic limit.
11,250	45,000	.004733	.003400	.002900	.002900	
11,500	46,000	.005467	.000734	....	....	
11,750	47,000	.005867	.000400	....	....	
12,000	48,000	.006533	.000666	....	....	
12,250	49,000	.006933	.000400	....	....	
12,500	50,000	.008233	.001300	.006133	.003233	
12,750	51,000	.008633	.000400	....	....	
13,000	52,000	.009567	.000934	....	....	
13,250	53,000	.010033	.000466	....	....	
13,500	54,000	.010900	.000867	....	....	
13,750	55,000	.011667	.000767	....	....	
14,000	56,000	.012500	.000833	....	....	
14,250	57,000	.013167	.000667	....	....	
14,500	58,000	.014200	.001033	....	....	
14,750	59,000	.015333	.001133	....	....	
15,000	60,000	.016300	.000967	....	....	
15,500	62,000	.018067	.001767	....	....	
16,000	64,000	.020100	.002033	....	....	
16,500	66,000	.022333	.002233	....	....	
17,000	68,000	.024400	.002067	....	....	
17,500	70,000	.027333	.002933	....	....	
18,000	72,000	.030333	.003000	....	....	
18,500	74,000	.033600	.003267	....	....	
19,000	76,000	.036833	.003233	....	....	
19,500	78,000	.040700	.003867	....	....	
20,000	80,000	.045500	.004800	....	....	
20,500	82,000	.051667	.006167	....	....	
21,000	84,000	.058000	.006333	....	....	
21,500	86,000	.069067	.011067	....	....	
22,000	88,000	.081833	.012766	....	....	
22,500	90,000	.1033*	.021467	....	....	
22,870	91,480	.1400	.0367	....	....	Tensile strength.
22,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	91,480
Elastic limit per square inch of original section	do....	44,000
Elongation per inch after rupture	inch..	0.1633
Elongation per inch under strain at elastic limit	do....	.001333
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18.3
Position of rupture		".45 from middle of stem.
Character of broken surface		granular, radiating from a small dull spot at circumference.
Elongation of inch sections		".19, ".17*, ".13

No. 661.

Marks, $\overset{12''\ \mathrm{T}}{\mathrm{W\ W\ 3}}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 3″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	0.	....	
2,500	10,000	.000133	.000100	0.	....	
3,750	15,000	.000300	.000167	0.	....	
5,000	20,000	.000400	.000100	0.	....	
6,250	25,000	.000567	.000167	—.000033	—.000033	
7,500	30,000	.000733	.000166	—.000033	0.	
8,750	35,000	.000900	.000167	—.000033	0.	
10,000	40,000	.001033	.000133	—.000033	0.	
10,250	41,000	.001067	.000034	....	....	
10,500	42,000	.001100	.000033	....	....	
10,750	43,000	.001133	.000033	....	....	
11,000	44,000	.001167	.000034	....	....	
11,250	45,000	.001200	.000033	—.000033	0.	
11,500	46,000	.001233	.000033	....	....	
11,750	47,000	.001267	.000034	....	....	
12,000	48,000	.001300	.000033	....	....	
12,250	49,000	.001333	.000033	....	....	
12,500	50,000	.001367	.000034	—.000033	0.	
12,750	51,000	.001400	.000033	....	....	
13,000	52,000	.001433	.000033	....	....	
13,250	53,000	.001533	.000100	....	....	
13,500	54,000	.001633	.000100	....	....	
13,750	55,000	.001700	.000067	0.	.000033	Elastic limit.
14,000	56,000	.002167	.000467	....	....	
14,250	57,000	.002433	.000266	....	....	
14,500	58,000	.002867	.000434	....	....	
14,750	59,000	.003233	.000366	....	....	
15,000	60,000	.004133	.000900	.001933	.001933	
15,500	62,000	.004967	.000834	....	....	
16,000	64,000	.006367	.001400	....	....	
16,500	66,000	.008000	.001633	....	....	
17,000	68,000	.009567	.001567	....	....	
17,500	70,000	.010833	.001266	....	....	
18,000	72,000	.012733	.001900	....	....	
18,500	74,000	.014500	.001767	....	....	
19,000	76,000	.016333	.001833	....	....	
19,500	78,000	.018033	.001700	....	....	
20,000	80,000	.019667	.001634	....	....	
20,500	82,000	.021667	.002000	....	....	
21,000	84,000	.023833	.002166	....	....	
21,500	86,000	.026367	.002534	....	....	
22,000	88,000	.029067	.002700	....	....	
22,500	90,000	.032000	.002933	....	....	
23,000	92,000	.0367	.0047	....	....	
23,500	94,000	.0400	.0033	....	....	
24,000	96,000	.0433	.0033	....	....	
24,500	98,000	.0483	.0050	....	....	
24,980	99,920	....	....	....	....	Tensile strength.
24,980	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	99,920
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.0533
Elongation per inch under strain at elastic limit	do....	.001700
Reduction in diameter at point of rupture	do....	.014
Reduction in area after rupture, per centum of original section		5.0
Position of rupture		″.35 from neck

Character of broken surface, fine granular, radiating from a line of dull-colored metal or seam ″.30 long in broken surface.

Elongation of inch sections .... ″.06*, ″.06, ″.04

No. 662.

Marks, $\overset{12''\ \mathrm{T}}{\mathrm{W\ W}_4}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000000	.000000	0.	....	
2,500	10,000	.000150	.000150	0.	....	
3,750	15,000	.000300	.000150	0.	....	
5,000	20,000	.000450	.000150	0.	....	
6,250	25,000	.000600	.000150	0.	....	
7,500	30,000	.000900	.000300	0.	....	
8,750	35,000	.001000	.000100	0.	....	
9,750	39,000	.001050	.000050	0.	....	Elastic limit.
10,000	40,000	.001450	.000400	.000350	....	
10,250	41,000	.002150	.000700	....	....	
10,500	42,000	.002600	.000450	....	....	
10,750	43,000	.002850	.000250	....	....	
11,000	44,000	.003350	.000500	....	....	
11,250	45,000	.003850	.000500	.002150	.001800	
11,500	46,000	.004350	.000500	....	....	
11,750	47,000	.004700	.000350	....	....	
12,000	48,000	.005050	.000350	....	....	
12,250	49,000	.005600	.000550	....	....	
12,500	50,000	.006400	.000800	.004450	.002300	
12,750	51,000	.006850	.000450	....	....	
13,000	52,000	.007650	.000800	....	....	
13,250	53,000	.008250	.000600	....	....	
13,500	54,000	.009150	.000900	....	....	
13,750	55,000	.009700	.000550	.007400	.002950	
14,000	56,000	.010900	.001200	....	....	
14,250	57,000	.011850	.000950	....	....	
14,500	58,000	.012400	.000550	....	....	
14,750	59,000	.013067	.000667	....	....	
15,000	60,000	.014150	.001083	.011600	.004200	
15,500	62,000	.015700	.001550	....	....	
16,000	64,000	.016900	.001200	....	....	
16,500	66,000	.019000	.002100	....	....	
17,000	68,000	.021500	.002500	....	....	
17,500	70,000	.023900	.002400	....	....	
18,000	72,000	.026150	.002250	....	....	
18,500	74,000	.029050	.002900	....	....	
19,000	76,000	.032000	.002950	....	....	
19,500	78,000	.035500	.003500	....	....	
20,000	80,000	.039450	.003950	....	....	
20,500	82,000	.0450	.005550	....	....	
21,000	84,000	.0500	.0050	....	....	
21,500	86,000	.0575	.0075	....	....	
22,000	88,000	.0650	.0075	....	....	
22,500	90,000	.0750	.0100	....	....	
23,000	92,000	.1150	.0400	....	....	Tensile strength.
23,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	92,000
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.1250
Elongation per inch under strain at elastic limit	do....	.001050
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		at middle of stem
Character of broken surface		fine granular, radiating from a dull spot at the circumference
Elongation of inch sections		″.12*, ″.13*

No. 663.

Marks, $\overset{12''}{W}\overset{T}{W}_5$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 2″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	
1,250	5,000	.000100	.000100	0.	....	Initial load.
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000450	.000200	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000750	.000150	0.	....	
7,500	30,000	.001000	.000250	0.	....	
8,750	35,000	.001150	.000150	0.	....	
9,000	36,000	.001200	.000050	....	....	
9,250	37,000	.001300	.000100	....	....	
9,500	38,000	.001350	.000050	....	....	
9,750	39,000	.001450	.000100	....	....	Elastic limit.
10,000	40,000	.001900	.000450	.000350	.000350	
10,250	41,000	.002050	.000150	....	....	
10,500	42,000	.002400	.000350	....	....	
10,750	43,000	.002700	.000300	....	....	
11,000	44,000	.003250	.000550	....	....	
11,250	45,000	.003650	.000400	.002050	.001650	
11,500	46,000	.004050	.000400	....	....	
11,750	47,000	.004400	.000350	....	....	
12,000	48,000	.004900	.000500	....	....	
12,250	49,000	.005400	.000500	....	....	
12,500	50,000	.006250	.000850	.004250	.002200	
12,750	51,000	.006750	.000500	....	....	
13,000	52,000	.007300	.000550	....	....	
13,250	53,000	.007850	.000550	....	....	
13,500	54,000	.008650	.000800	....	....	
13,750	55,000	.009300	.000650	.007150	.002900	
14,000	56,000	.010450	.001150	....	....	
14,250	57,000	.010750	.000300	....	....	
14,500	57,000	.011600	.000850	....	....	
14,750	59,000	.012100	.000500	....	....	
15,000	60,000	.[illegible]3400	.001300	.010900	.003750	
15,500	62,000	.014750	.001350	....	....	
16,000	64,000	.016800	.002050	....	....	
16,500	66,000	.018550	.001750	....	....	
17,000	68,000	.020600	.002050	....	....	
17,500	70,000	.022900	.002300	....	....	
18,000	72,000	.025550	.002650	....	....	
18,500	74,000	.028400	.002850	....	....	
19,000	76,000	.031000	.002600	....	....	
19,500	78,000	.034250	.003250	....	....	
20,000	80,000	.038350	.004100	....	....	
20,500	82,000	.0450	.006650	....	....	
21,000	84,000	.0500	.0050	....	....	
21,500	86,000	.0550	.0050	....	....	
22,000	88,000	.0625	.0075	....	....	
22,380	89,520	.0750	.0075	....	....	Tensile strength.
22,380	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	89,520
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.0750
Elongation per inch under strain at elastic limit	do....	.001450
Reduction in diameter at point of rupture	do....	.034
Reduction in area after rupture, per centum of original section		11.8
Position of rupture		″.25 from middle of stem

Character of broken surface, fine granular, radiating from a line of dull-colored metal extending across broken surface.

Elongation of inch sections .... ″.07 ″.08*

No. 509.

Marks, $^{12''\ \mathrm{T}}_{\mathrm{W\ W\ 6}}$

Length, 4″.5.

Diameter, ″.797.

Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000333	.000166	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	.000033	.000033	
12,500	25,000	.000833	.000166	.000033	0.	
15,000	30,000	.001000	.000167	.000067	.000034	
17,500	35,000	.001167	.000167	.000067	0.	
20,000	40,000	.001333	.000166	.000067	0.	
20,500	41,000	.001367	.000034	....	....	
21,000	42,000	.001400	.000033	....	....	
21,500	43,000	.001433	.000033	....	....	
22,000	44,000	.001467	.000034	....	....	
22,500	45,000	.001500	.000033	.000067	0.	
23,000	46,000	.001533	.000033	....	....	Elastic limit.
23,500	47,000	{ .001633 { .002967	.000100 .001334	....	....	
24,000	48,000	.003333	.000366	....	....	
24,500	49,000	.003867	.000534	....	....	
25,000	50,000	.004533	.000666	.002833	.002766	
25,500	51,000	.004867	.000334	....	....	
26,000	52,000	.005333	.000466	....	....	
26,500	53,000	.006167	.000834	....	....	
27,000	54,000	.006900	.000733	....	....	
27,500	55,000	.007833	.000933	.005833	.003000	
28,000	56,000	.008300	.000467	....	....	
28,500	57,000	.009067	.000767	....	....	
29,000	58,000	.009567	.000500	....	....	
29,500	59,000	.010333	.000766	....	....	
30,000	60,000	.011267	.000934	.009000	.003167	
49,910	99,820	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	46,000
Compression per inch under stress at elastic limit	inch..	0.001533
Ultimate strength per square inch of original section	pounds..	99,820
Manner of failure		triple flexure

No. 510.

Marks, $\frac{12'' \ T}{W \ W \ 7}$
Length, 4''.5.
Diameter, ''.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000200	.000200	0.	....	
5,000	10,000	.000400	.000200	0.	....	
7,500	15,000	.000567	.000167	0.	....	
10,000	20,000	.000733	.000166	0.	....	
12,500	25,000	.000900	.000167	0.	....	
15,000	30,000	.001067	.000167	0.	....	
17,500	35,000	.001200	.000133	0.	....	
20,000	40,000	.001367	.000167	.000033	.000033	
20,500	41,000	.001400	.000033	....	....	
21,000	42,000	.001433	.000033	....	....	
21,500	43,000	.001467	.000034	....	....	
22,000	44,000	.001500	.000033	....	....	
22,500	45,000	.001533	.000033	.000033	.0	
23,000	46,000	.001567	.000034	....	....	
23,500	47,000	.001600	.000033	....	....	Elastic limit.
24,000	48,000	.003000	.001400	....	....	
24,500	49,000	.003667	.000667	....	....	
25,000	50,000	.004133	.000466	.002333	.002300	
25,500	51,000	.004633	.000500	....	....	
26,000	52,000	.005067	.000434	....	....	
26,500	53,000	.005667	.000600	....	....	
27,000	54,000	.006433	.000766	....	....	
27,500	55,000	.006933	.000500	.004833	.004500	
28,000	56,000	.007500	.000567	....	....	
28,500	57,000	.008000	.000500	....	....	
29,000	58,000	.008667	.000667	....	....	
29,500	59,000	.009267	.000600	....	....	
30,000	60,000	.009967	.000700	.007700	.002867	
51,200	102,400	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	47,000
Compression per inch under stress of elastic limit	inch..	0.001600
Ultimate strength per square inch of original section	pounds..	102,400
Manner of failure		triple flexure

No. 511.

Marks, $\frac{12''\ \mathrm{T}}{\mathrm{W\ W\ 8}}$
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000133	.000133	0.	....	
5,000	10,000	.000333	.000200	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	0.	....	
12,500	25,000	.000833	.000166	0.	....	
15,000	30,000	.001000	.000167	0.	....	
17,500	35,000	.001133	.000133	0.	....	
20,000	40,000	.001300	.000167	0.	....	
20,500	41,000	.001333	.000033	....	....	
21,000	42,000	.001367	.000034	....	....	
21,500	43,000	.001400	.000033	....	....	
22,000	44,000	.001433	.000033	....	....	
22,500	45,000	.001467	.000034	0.	....	
23,000	46,000	.001500	.000033	....	....	
23,500	47,000	.001533	.000033	....	....	
24,000	48,000	.001600	.000067	....	....	
24,500	49,000	.001667	.000067	....	....	Elastic limit.
25,000	50,000	.001767	.000100	.000167	.000167	
25,500	51,000	.001933	.000166	....	....	
26,000	52,000	.002567	.000634	....	....	
26,500	53,000	.002900	.000333	....	....	
27,000	54,000	.003433	.000533	....	....	
27,500	55,000	.003900	.000467	.002000	.001833	
28,000	56,000	.004267	.000367	....	....	
28,500	57,000	.004833	.000566	....	....	
29,000	58,000	.005267	.000434	....	....	
29,500	59,000	.005933	.000666	....	....	
30,000	60,000	.006500	.000567	.004333	.002333	
49,150	98,300	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	49,000
Compression per inch under stress at elastic limit	inch..	0.001667
Ultimate strength per square inch of original section	pounds..	98,300
Manner of failure		triple flexure
Specific gravity		7.8652
Hardness		20.70

No. 512.

Marks, $\overset{12''\ \mathrm{T}}{\mathrm{W\ W\ 9}}$
Length; 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000333	.000166	0.	....	
7,500	15,000	.000500	.000167	0.	....	
10,000	20,000	.000667	.000167	0.	....	
12,500	25,000	.000800	.000133	0.	....	
15,000	30,000	.000933	.000133	0.	....	
17,500	35,000	.001133	.000200	.000033	.000033	
20,000	40,000	.001333	.000200	.000067	.000034	Elastic limit.
20,500	41,000	.001500	.000167	....	....	
21,000	42,000	.001700	.000200	....	....	
21,500	43,000	.003033	.001333	....	....	
22,000	44,000	.004333	.001300	....	....	
22,500	45,000	.004833	.000500	.003200	.003133	
23,000	46,000	.005267	.000434	....	....	
23,500	47,000	.005833	.000566	....	....	
24,000	48,000	.006467	.000634	....	....	
24,500	49,000	.007100	.000633	....	....	
25,000	50,000	.007833	.000733	.005967	.002767	
25,500	51,000	.008333	.000500	....	....	
26,000	52,000	.008967	.000634	....	....	
26,500	53,000	.009600	.000633	....	....	
27,000	54,000	.010500	.000900	....	....	
27,500	55,000	.011267	.000767	.009167	.003200	
28,000	56,000	.011867	.000600	....	....	
28,500	57,000	.012533	.000666	....	....	
29,000	58,000	.013267	.000734	....	....	
29,500	59,000	.014300	.001033	....	....	
30,000	60,000	.015167	.000867	.012800	003633	
41,200	82,400	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section.....pounds..	40,000
Compression per inch under stress at elastic limit.....inch..	0.001333
Ultimate strength per square inch of original section.....pounds..	82,400
Manner of failure.....	triple flexure
Specific gravity.....	7.8684
Hardness.....	15.75

No. 513.

Marks, $\overset{12''}{\mathrm{W}}\ \overset{\mathrm{T}}{\mathrm{W}}\ 10$
Length, 5″.
Diameter, ″.797.
Sectional area, .50 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	1,000	0.	0.	0.	0.	Initial load.
2,500	5,000	.000167	.000167	0.	....	
5,000	10,000	.000333	.000166	0.	....	
7,500	15,000	.000500	.000167	.000033	.000033	
10,000	20,000	.000667	.000167	.000033	0.	
12,500	25,000	.000833	.000166	.000067	.000034	
15,000	30,000	.000967	.000134	.000067	0.	
17,500	35,000	.001133	.000166	.000067	0.	
20,000	40,000	.001300	.000167	.000067	0.	
20,500	41,000	.001333	.000033	....	....	
21,000	42,000	.001367	.000034	....	....	
21,500	43,000	.001400	.000033	....	....	
22,000	44,000	.001433	.000033	....	....	
22,500	45,000	.001467	.000034	.000100	.000033	
23,000	46,000	.001500	.000033	....	....	
23,500	47,000	.001533	.000033	....	....	
24,000	48,000	.001600	.000067	....	....	
24,500	49,000	.001600	0.	....	....	
25,000	50,000	.001633	.000033	.000133	.000033	
25,500	51,000	.001667	.000034	....	....	
26,000	52,000	.001700	.000033	....	....	
26,500	53,000	.001733	.000033	....	....	
27,000	54,000	.001833	.000100	....	....	
27,500	55,000	.001933	.000100	.000167	....	Elastic limit.
28,000	56,000	.001933	0.	....	....	Deflected, convex on the micrometer side of the specimen.
28,500	57,000	.001833	— .000100	....	....	
29,000	58,000	.001833	.0	....	....	
29,500	59,000	.001867	.000034	....	....	
30,000	60,000	.001933	.000066	— .000033	— .000200	
30,500	61,000	.002067	.000134	....	....	
31,000	62,000	.002400	.000333	....	....	
31,500	63,000	.003067	.000667	....	....	
32,000	64,000	.003833	.000766	....	....	
32,500	65,000	.004500	.000667	.000567	.000600	
49,910	99,820	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	55,000
Compression per inch under stress at elastic limit	inch..	0.001933
Ultimate strength, per square inch of original section	pounds..	99,820
Manner of failure		triple flexure
Specific gravity		7.8636
Hardness		30.14

9.—STEEL SPECIMENS FROM BREECH MECHANISM FORGINGS.

No. 386.

Tension Test.

Mark on bar, $^{10}\frac{\mathrm{B}}{\mathrm{I}}{}^{\mathrm{B}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	.000033	.000033	
2,500	10,000	.000433	.000200	.000067	.000034	
3,750	15,000	.000600	.000167	.000067	0.	
5,000	20,000	.000700	.000100	.000067	0.	
6,250	25,000	.000867	.000167	.000067	0.	
7,500	30,000	.000967	.000100	.000067	0.	
7,750	31,000	.001000	.000033	....	....	
8,000	32,000	.001033	.000033	....	....	
8,250	33,000	.001067	.000034	....	....	
8,500	34,000	.001100	.000033	....	....	
8,750	35,000	.001133	.000033	.000067	0.	
9,000	36,000	.001167	.000034	....	....	
9,250	37,000	.001200	.000033	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	
10,000	40,000	.001300	.000033	.000100	.000033	
10,250	41,000	.001333	.060033	....	....	
10,500	42,000	.001367	.000034	....	....	
10,750	43,000	.001367	0.	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001433	.000033	.000133	.000033	
11,500	46,000	.001500	.000067	....	....	
11,750	47,000	.001533	.000033	....	....	
12,000	48,000	.001600	.000067	....	....	
12,250	49,000	.001633	.000033	....	....	
12,500	50,000	.001700	.000067	.000267	.000134	Elastic limit.
12,750	51,000	.001833	.000133	....	....	
13,000	52,000	.001933	.000100	....	....	
13,250	53,000	.002033	.000100	....	....	
13,500	54,000	.002267	.000234	....	....	
13,750	55,000	.002400	.000133	.000767	.000500	
14,000	56,000	.002933	.000533	....	....	
14,250	57,000	.003333	.000400	....	....	
14,500	58,000	.003900	.000567	....	....	
14,750	59,000	.004900	.001000	....	....	
15,000	60,000	.005833	.000933	.003700	.002933	
15,250	61,000	.006567	.000734	....	....	
15,500	62,000	.007233	.000666	....	....	
15,750	63,000	.007900	.000667	....	....	
16,000	64,000	.009133	.001233	....	....	
16,250	65,000	.010200	.001076	.007800	.004100	
16,500	66,000	.010833	.000633	....	....	
16,750	67,000	.011433	.000600	....	....	
17,000	68,000	.012667	.001234	....	....	
17,250	69,000	.013400	.000733	....	....	
17,500	70,000	.014933	.001533	.012233	.004433	
18,000	72,000	.016267	.001334	....	....	
18,500	74,000	.018267	.002000	....	....	
19,000	76,000	.020400	.002133	....	....	
19,500	78,000	.022833	.002433	....	....	
20,000	80,000	.026033	.003200	....	....	
20,500	82,000	.027733	.001700	....	....	
21,000	84,000	.031333	.003600	....	....	
21,500	86,000	.035000	.003667	....	....	
22,000	88,000	.038367	.003367	....	....	
22,500	90,000	.043267	.004900	....	....	
23,000	92,000	.049967	.006700	....	....	
23,500	94,000	.058067	.008100	....	....	Micrometer removed.
24,000	96,000	.0700	.011933	....	....	
24,500	98,000	.0900	.0200	....	....	
24,710	98,840	.1200	.0300	....	....	Ultimate strength.
22,400	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	57.862
Hardness	21.17
Tensile strength per square inch of original section ....pounds..	98,840
Elastic limit per square inch of original section ....do....	50,000
Elongation per inch after rupture ....inch..	0.1767
Elongation per inch under strain at elastic limit ....do....	.001700
Reduction in diameter at point of rupture ....do....	.104
Reduction in area after rupture, per centum of original section	83.5
Position of rupture	″.80 from neck
Character of broken surface	granular, with dull center
Elongation of inch sections	″.10 ″.16 (″.27 fractured sections)

No. 387.

Tension Test.

Marks on bar, $^{10}\overset{\text{B}}{\text{O}}{}^{\text{B}}$
Diameter, ″.564.
Sectional area .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000400	.000133	0.	....	
5,000	20,000	.000600	.000200	.000033	.000033	
6,250	25,000	.000733	.000133	.000033	0.	
7,500	30,000	.000933	.000200	.000033	0.	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.000967	0.	....	....	
8,250	33,000	.001000	.000033	....	....	
8,500	34,000	.001033	.000033	....	....	
8,750	35,000	.001067	.000034	.000033	0.	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001167	.000034	....	....	
9,750	39,000	.001200	.000033	....	....	
10,000	40,000	001233	.000033	.000033	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000067	.000034	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001567	.000034	.000067	0.	
12,750	51,000	.001667	.000100	....	....	
13,000	52,000	.001700	.000033	....	....	
13,250	53,000	.001733	.000033	....	....	
13,500	54,000	.001767	.000034	....	....	
13,750	55,000	.001800	.000033	.000133	.000066	
14,000	56,000	.001933	.000133	....	....	
14,250	57,000	.001967	.000034	....	....	Elastic limit.
14,500	58,000	.002067	.000100	....	....	
14,750	59,000	.002200	.000133	....	....	
15,000	60,000	.002333	.000133	.000433	.000300	
15,250	61,000	.002600	.000267	....	....	
15,500	62,000	.002933	.000333	....	....	
15,750	63,000	.003467	.000534	....	....	
16,000	64,000	.004967	.001500	....	....	
16,250	65,000	.005433	.000466	.003267	.002834	
16,500	66,000	.006800	.001367	....	....	
16,750	67,000	.007400	.000600	....	....	
17,000	68,000	.008467	.001067	....	....	
17,250	69,000	.009533	.001066	....	....	
17,500	70,000	.010567	.001034	.008233	.004966	
18,000	72,000	.012700	.002133	....	....	
18,500	74,000	.014000	.001300	....	....	
19,000	76,000	.016267	.002267	....	....	
19,500	78,000	.018667	.002400	....	....	
20,000	80,000	.021000	.002333	....	....	
20,500	82,000	.023400	.002400	....	....	
21,000	84,000	.025833	.002433	....	....	
21,500	86,000	.029267	.003434	....	....	
22,000	88,000	.032333	.003066	....	....	
22,500	90,000	.035933	.003600	....	....	
23,000	92,000	.040933	.005000	....	....	
23,500	94,000	.045833	.004900	....	....	
24,000	96,000	.052167	.006334	....	....	
24,500	98,000	.062000	.009833	....	....	
25,000	100,000	.077667	.015667	....	....	Micrometer removed.
25,340	101,360	.1167	.039033	....	....	Ultimate strength.
22,100	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength, per square inch of original section	pounds	101,360
Elastic limit, per square inch of original section	do	57,000
Elongation per inch after rupture	inch	0.2033
Elongation per inch under strain at elastic limit	do	.001967
Reduction in diameter at point of rupture	do	.134
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		1″ from neck
Character of broken surface		granular, 60 per cent., dull spongy center, 40 per cent
Elongation of inch sections		″.13, ″.18 (″.30 fractured section)

No. 406.

Compression Test.

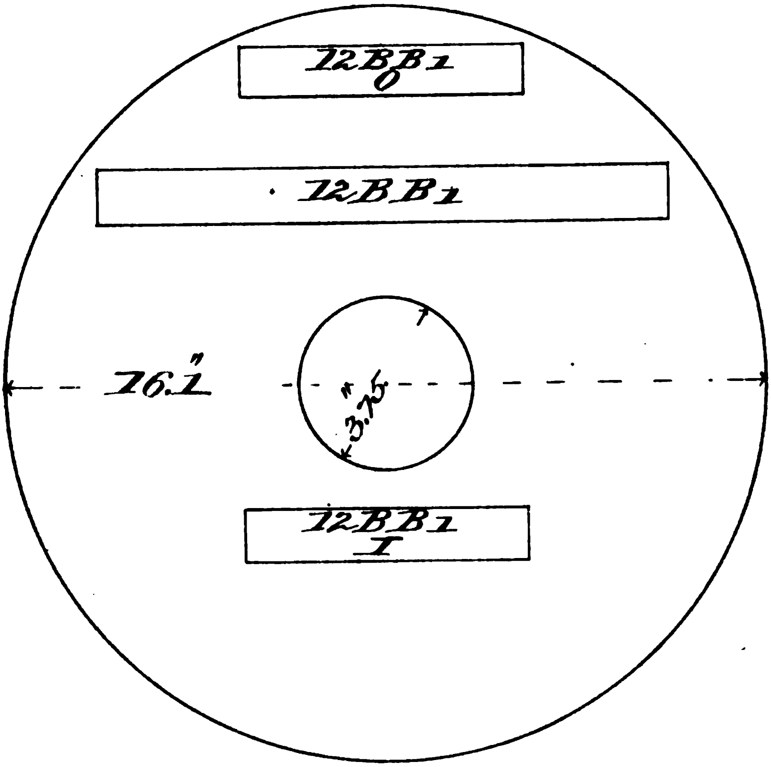
Marks on bar, 10 B B
Length, 11″.976.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000130	.000130	0.	....	
10,000	10,000	.000280	.000150	0.	....	
15,000	15,000	.000430	.000150	0.	....	
20,000	20,000	.000610	.000180	0.	....	
25,000	25,000	.000780	.000170	.000010	.000010	
30,000	30,000	.000940	.000160	.000010	0.	
31,000	31,000	.000980	.000040	....	....	
32,000	32,000	.001010	.000030	....	....	
33,000	33,000	.001040	.000030	....	....	
34,000	34,000	.001080	.000040	....	....	
35,000	35,000	.001110	.000030	.000010	0.	
36,000	36,000	.001140	.000030	....	....	
37,000	37,000	.001180	.000040	....	....	
38,000	38,000	.001210	.000030	....	....	
39,000	39,000	.001240	.000030	....	....	
40,000	40,000	.001280	.000040	.000010	0.	
41,000	41,000	.001310	.000030	....	....	
42,000	42,000	.001350	.000040	....	....	
43,000	43,000	.001380	.000030	....	....	
44,000	44,000	.001420	.000040	....	....	
45,000	45,000	.001460	.000040	.000030	.000020	
46,000	46,000	.001490	.000030	....	....	
47,000	47,000	.001530	.000040	....	....	
48,000	48,000	.001570	.000040	....	....	
49,000	49,000	.001610	.000040	....	....	Elastic limit.
50,000	50,000	.001670	.000060	.000090	.000060	
51,000	51,000	.001730	.000060	....	....	
52,000	52,000	.001780	.000050	....	....	
53,000	53,000	.001870	.000090	....	....	
54,000	54,000	.001960	.000090	....	....	
55,000	55,000	.002110	.000150	.000310	.000220	
56,000	56,000	.002290	.000180	....	....	
57,000	57,000	.002570	.000280	....	....	
58,000	58,000	.002940	.000370	....	....	
59,000	59,000	.003510	.000570	....	....	
60,000	60,000	.004680	.001170	.002610	.002300	
61,000	61,000	.005400	.000720	....	....	
62,000	62,000	.007200	.001800	....	....	
63,000	63,000	.009000	.001800	....	....	
64,000	64,000	.011500	.002500	.009650	.007040	Ultimate strength.
40,000	....	....	....	....	....	Load sustained when test was discontinued.

General summary.

Elastic limit per square inch of original section..................pounds.. 49,000
Compression per inch under stress at elastic limit..................inch.. 0.001610
Ultimate strength per square inch of original section..................pounds.. 64,000
Manner of failure..................triple flexure
Middle deflection after the test..................inch.. .86

12 inch Breech Block



No. 388.

Tension Test.

Marks on bar, $^{12}\overset{\mathrm{B}}{0}{}^{\mathrm{B}_1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	—.000033	.000033	0.	....	
2,500	10,000	—.000067	.000034	—.000067	—.000067	
3,750	15,000	.000067	0.	—.000100	—.000033	
5,000	20,000	.000233	.000166	—.000100	0.	
6,250	25,000	000433	.000200	—.000100	0.	
7,500	30,000	.000567	.000134	—.000100	0.	
7,750	31,000	.000633	.000066	....	....	
8,000	32,000	.000667	.000034	....	....	
8,250	33,000	.000700	.000033	....	....	
8,500	34,000	.000733	.000033	....	....	
8,750	35,000	.000800	.000067	—.000100	0.	
9,000	36,000	.000800	0.	....	....	
9,250	37,000	.000833	.000033	....	....	
9,500	38,000	.000867	.000034	....	....	
9,750	39,000	.000900	.000033	....	....	
10,000	40,000	.000933	.000033	—.000100	0.	
10,250	41,000	.000967	.000034	....	....	
10,500	42,000	.001000	.000033	....	....	
10,750	43,000	.001033	.000033	....	....	
11,000	44,000	.001067	.000034	....	....	
11,250	45,000	.001100	.000033	—.000100	0.	
11,500	46,000	.001133	.000033	....	....	
11,750	47,000	.001167	.000034	....	....	
12,000	48,000	.001200	.000033	....	....	
12,250	49,000	.001267	.000067	....	....	
12,500	50,000	.001300	.000033	—.000100	0.	
12,750	51,000	.001300	0.	....	....	
13,000	52,000	.001333	.000033	....	....	
13,250	53,000	.001367	.000034	....	....	
13,500	54,000	.001467	.000100	....	....	
13,750	55,000	.001533	.000066	—.000100	0.	
14,000	56,000	.001567	.000034	....	....	
14,250	57,000	.001600	.000033	....	....	Elastic limit.
14,500	58,000	.001700	.000100	....	....	
14,750	59,000	.001833	.000133	....	....	
15,000	60,000	.001933	.000100	.000033	.000133	
15,250	61,000	.002133	.000200	....	....	
15,500	62,000	.002467	.000334	....	....	
15,750	63,000	.003200	.000733	....	....	
16,000	64,000	.004067	.000867	....	....	
16,250	65,000	.004967	.000900	.002633	.002600	
16,500	66,000	.006067	.001100	....	....	
16,750	67,000	.006800	.000733	....	....	
17,000	68,000	.007967	.001167	....	....	
17,250	69,000	.008667	.000700	....	....	
17,500	70,000	.009933	.001266	.007300	.004667	
18,000	72,000	.011400	.001467	....	....	
18,500	74,000	.013500	.002100	....	....	
19,000	76,000	.015567	.002067	....	....	
19,500	78,000	.017900	.002333	....	....	
20,000	80,000	.020300	.002400	....	....	
20,500	82,000	.023167	.002867	....	....	
21,000	84,000	.025333	.002166	....	....	
21,500	86,000	.028233	.002900	....	....	
22,000	88,000	.031233	.003000	....	....	
22,500	90,000	.035167	.003934	....	....	
23,000	92,000	.039233	.004066	....	....	
23,500	94,000	.044967	.005734	....	....	
24,000	96,000	.051333	.006366	....	....	
24,500	98,000	.060567	.009234	....	....	
25,000	100,000	.075667	.015100	....	....	
25,200	100,800	.1000	.024333	....	....	Ultimate strength.
22,900	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..pounds.. 100,800
Elastic limit per square inch of original section..do.... 57,000
Elongation per inch after rupture..inch.. 0.1500
Elongation per inch under strain at elastic limit..do.... .001600
Reduction in diameter at point of rupture..do.... .104
Reduction in area after rupture, per centum of original section.. 33.5
Position of rupture .... ″.70 from neck
Character of broken surface...granular, small dull spot near the center
Elongation of inch sections.. ″.08, ″.11 (″.26 fractured section)

No. 389.

Tension Test.

Marks on bar, $^{12}\frac{B}{I}^{B_1}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000033	.000033	0.	....	
2,500	10,000	.000133	.000100	0.	....	
3,750	15,000	.000300	.000167	0.	....	
5,000	20,000	.000533	.000233	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000833	.000166	0.	....	
7,750	31,000	.000867	.000034	....	....	
8,000	32,000	.000900	.000033	....	....	
8,250	33,000	.000933	.000033	....	....	
8,500	34,000	.000967	.000034	....	....	
8,750	35,000	.001000	.000033	0.	....	
9,000	36,000	.001000	0.	....	....	
9,250	37,000	.001033	.000033	....	....	
9,500	38,000	.001067	.000034	....	....	
9,750	39,000	.001100	.000033	....	....	
10,000	40,000	.001133	.000033	0.	....	
10,250	41,000	.001200	.000067	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001367	.000067	.000033	.000033	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	Elastic limit.
12,250	49,000	.001600	.000133	....	....	
12,500	50,000	.001767	.000167	.000200	.000167	
12,750	51,000	.001833	.000166	....	....	
13,000	52,000	.002067	.000234	....	....	
13,250	53,000	.002300	.000233	....	....	
13,500	54,000	.002633	.000333	....	....	
13,750	55,000	.003333	.000700	.001433	.001233	
14,000	56,000	.004133	.000800	....	....	
14,250	57,000	.004633	.000500	....	....	
14,500	58,000	.006133	.001500	....	....	
14,750	59,000	.006800	.000667	....	....	
15,000	60,000	.008400	.001600	.006200	.004767	
15,250	61,000	.009033	.000633	....	....	
15,500	62,000	.009767	.000734	....	....	
15,750	63,000	.010433	.000666	....	....	
16,000	64,000	.011833	.001400	....	....	
16,250	65,000	.012467	.000634	.010033	.003833	
16,500	66,000	.013567	.001100	....	....	
16,750	67,000	.014300	.000733	....	....	
17,000	68,000	.015300	.001000	....	....	
17,250	69,000	.016467	.001167	....	....	
17,500	70,000	.017767	.001300	.014967	.004934	
18,000	72,000	.019667	.001900	....	....	
18,500	74,000	.022333	.002666	....	....	
19,000	76,000	.025000	.002667	....	....	
19,500	78,000	.027667	.002667	....	....	
20,000	80,000	.031333	.003666	....	....	
20,500	82,000	.034333	.003000	....	....	
21,000	84,000	.038333	.004000	....	....	
21,500	86,000	.044167	.005834	....	....	
22,000	88,000	.049933	.005766	....	....	
22,500	90,000	.057933	.008000	....	....	Micrometer removed.
23,000	92,000	.0733	.015367	....	....	
23,500	94,000	.0900	.0167	....	....	
23,680	94,720	.1267	.0367	....	....	Ultimate strength.
21,200	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	94,720
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	1.1733
Elongation per inch under strain at elastic limit	do....	.001467
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		86.4
Position of rupture		″.85 from neck
Character of broken surface		granular, dull spot near the center
Elongation of inch sections		″.11, ″.13 (″.28 fractured section)

No. 405.

Compression Test.

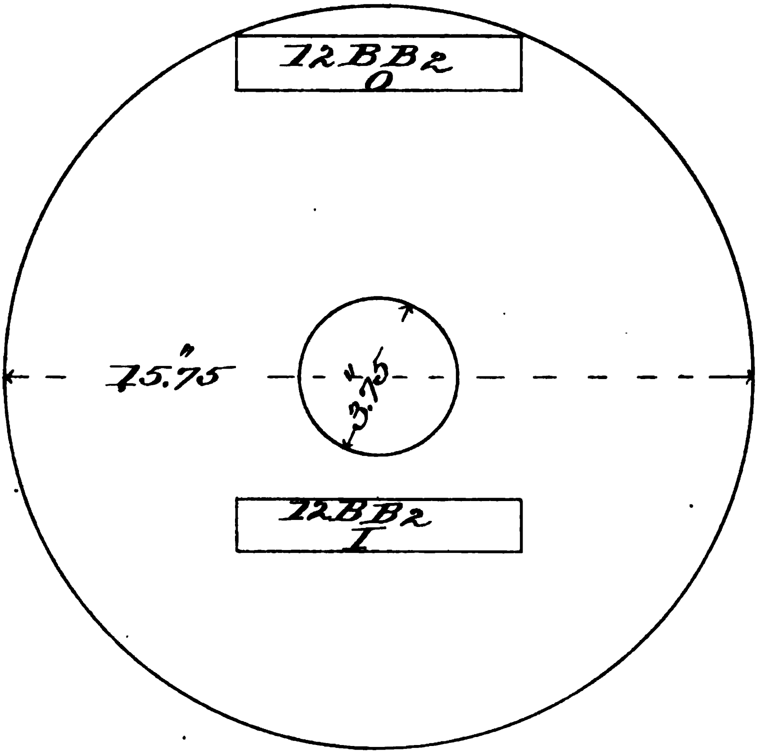
Marks on bar, 12 B B$_1$
Length, 11″.955.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	0.	....	
10,000	10,000	.000260	.000150	0.	....	
15,000	15,000	.000420	.000160	0.	....	
20,000	20,000	.000590	.000170	0.	....	
25,000	25,000	.000750	.000160	0.	....	
30,000	30,000	.000920	.000170	0.	....	
31,000	31,000	.000950	.000030	....	....	
32,000	32,000	.000990	.000040	....	....	
33,000	33,000	.001030	.000040	....	....	
34,000	34,000	.001060	.000030	....	....	
35,000	35,000	.001090	.000030	0.	....	
36,000	36,000	.001110	.000020	....	....	
37,000	37,000	.001150	.000040	....	....	
38,000	38,000	.001190	.000040	....	....	
39,000	39,000	.001220	.000030	....	....	
40,000	40,000	.001250	.000030	0.	....	
41,000	41,000	001290	.000040	....	....	
42,000	42,000	.001330	.000040	....	....	
43,000	43,000	.001380	.000050	....	....	
44,000	44,000	.001420	.000040	....	....	
45,000	45,000	.001470	.000050	.000030	.000030	
46,000	46,000	.001510	.000040	....	....	
47,000	47,000	.001560	.000050	....	....	
48,000	48,000	.001610	.000050	....	....	Elastic limit.
49,000	49,000	.001690	.000080	....	....	
50,000	50,000	.001790	.000100	.000210	.000180	
51,000	51,000	.001910	.000120	....	....	
52,000	52,000	.002080	.000170	....	....	Perceptible deflection.
53,000	53,000	.002290	.000210	....	....	
54,000	54,000	.002860	.000570	....	....	
55,000	55,000	.003130	.000270	.001310	.001100	
56,000	56,000	.003580	.000450	....	....	
57,000	57,000	.004150	.000570	....	....	
58,000	58,000	.004910	.000760	....	....	
59,000	59,000	.005990	.001080	....	....	
60,000	60,000	.007700	.001710	.005480	.004170	
63,100	63,100	....	....	....	....	Ultimate strength.
40,000	....	....	....	....	....	Load sustained when test was discontinued.

General summary.

Elastic limit per square inch of original section ....pounds.. 48,000
Compression per inch under stress of elastic limit ....inch.. .001610
Ultimate strength per square inch of original section ....pounds.. 63,100
Manner of failure ....triple flexture
Middle deflection after the test ....″.80

12 inch Breech Block.



No. 390.

Tension Test.

Marks on bar, $^{12}\frac{\mathrm{B}}{\mathrm{O}}\mathrm{B}_2$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000633	.000200	0.		
6,250	25,000	.000767	.000134	0.		
7,500	30,000	.000933	.000166	0.		
7,750	31,000	.000933	0.			
8,000	32,000	.000967	.000034			
8,250	33,000	.001000	.000033			
8,500	34,000	.001033	.000033			
8,750	35,000	.001067	.000034	0.		
9,000	36,000	.001100	.000033			
9,250	37,000	.001133	.000033			
9,500	38,000	.001133	0.			
9,750	39,000	.001167	.000034			
10,000	40,000	.001200	.000033	0.		
10,250	41,000	.001233	.000033			
10,500	42,000	.001267	.000034			
10,750	43,000	.001267	0.			
11,000	44,000	.001300	.000033			
11,250	45,000	.001333	.000033	0.		
11,500	46,000	.001367	.000034			
11,750	47,000	.001400	.000033			
12,000	48,000	.001433	.000033			
12,250	49,000	.001467	.000034			
12,500	50,000	.001500	.000033	0.		
12,750	51,000	.001533	.000033			
13,000	52,000	.001567	.000034			
13,250	53,000	.001600	.000033			
13,500	54,000	.001667	.000067			
13,750	55,000	.001667	0.	.000033	.000033	
14,000	56,000	.001733	.000066			
14,250	57,000	.001767	.000034			
14,500	58,000	.001800	.000033			Elastic limit.
14,750	59,000	.001867	.000067			
15,000	60,000	.001967	.000100	.000200	.000167	
15,250	61,000	.002100	.000133			
15,500	62,000	.002300	.000200			
15,750	63,000	.002500	.000200			
16,000	64,000	.003067	.000567			
16,250	65,000	.003600	.000533	.001467	.000267	
16,500	66,000	.004600	.001000			
16,750	67,000	.005400	.000800			
17,000	68,000	.006333	.000933			
17,250	69,000	.007400	.001067			
17,500	70,000	.008767	.001367	.006267	.004800	
18,000	72,000	.010400	.001633			
18,500	74,000	.012600	.002200			
19,000	76,000	.015067	.002467			
19,500	78,000	.016333	.001266			
20,000	80,000	.018467	.002134			
20,500	82,000	.020733	.002266			
21,000	84,000	.023367	.002634			
21,500	86,000	.026000	.002633			
22,000	88,000	.029333	.003333			
22,500	90,000	.032000	.002667			
23,000	92,000	036000	.004000			
23,500	94,000	.040000	.004000			
24,000	96,000	.045333	.005333			
24,500	98,000	.055000	.009667			
25,000	100,000	.064000	.009000			
25,500	102,000	.079333	.015333			Micrometer removed.
25,640	102,560	.1067	.027367			Ultimate strength.
21,900						Load at time of rupture.

General summary.

Tensile strength per square inch of original section ....pounds..	102,560
Elastic limit per square inch of original section....................do....	58,000
Elongation per inch after rupture....................inch..	0.1867
Elongation per inch under strain at elastic limit....................do....	.001800
Reduction in diameter at point of rupture....................do....	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	″.95 from neck
Character of broken surface ....granular, 50 per cent.; dull spongy center, 50 per cent	
Elongation of inch sections	″.09, ″.15 (″.32 fractured section)

No. 391.

Tension Test.

Marks on bar, $^{12}\frac{\mathrm{B}}{\mathrm{I}}\mathrm{B}$.
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000267	.000134	0.	....	
3,750	15,000	.000433	.000166	.000033	.000033	
5,000	20,000	.000633	.000200	.000033	0.	
6,250	25,000	.000767	.000134	.000033	0.	
7,500	30,000	.000933	.000166	.000067	.000034	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001033	.000033	....	....	
8,500	34,000	.001067	.000034	....	....	
8,750	35,000	.001100	.000033	.000067	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001200	0.	....	....	
10,000	40,000	.001233	.000033	.000067	0.	
10,250	41,000	.001267	.000034	....	....	
10,500	42,000	.001300	.000033	....	....	
10,750	43,000	.001333	.000033	....	....	
11,000	44,000	.001367	.000034	....	....	
11,250	45,000	.001400	.000033	.000067	0.	
11,500	46,000	.001467	.000067	....	....	
11,750	47,000	.001500	.000033	....	....	
12,000	48,000	.001533	.000033	....	....	
12,250	49,000	.001567	.000034	....	....	Elastic limit.
12,500	50,000	.001667	.000100	.000233	.000166	
12,750	51,000	.001933	.000266	....	....	
13,000	52,000	.002500	.000567	....	....	
13,250	53,000	.002833	.000333	....	....	
13,500	54,000	.004167	.001334	....	....	
13,750	55,000	.004667	.000500	.002667	.002434	
14,000	56,000	.005667	.001000	....	....	
14,250	57,000	.006033	.000366	....	....	
14,500	58,000	.006833	.000800	....	....	
14,750	59,000	.007533	.000700	....	....	
15,000	60,000	.008500	.000967	.006333	.003666	
15,250	61,000	.009367	.000867	....	....	
15,500	62,000	.009900	.000533	....	....	
15,750	63,000	.010533	.000633	....	....	
16,000	64,000	.011500	.000967	....	....	
16,250	65,000	.012533	.001033	.010167	.003834	
16,500	66,000	.013500	.000967	....	....	
16,750	67,000	.014100	.000600	....	....	
17,000	68,000	.014933	.000833	....	....	
17,250	69,000	.015900	.000967	....	....	
17,500	70,000	.017133	.001233	.014400	.004233	
18,000	72,000	.018933	.001800	....	....	
18,500	74,000	.021233	.002300	....	....	
19,000	76,000	.023733	.002500	....	....	
19,500	78,000	.026233	.002500	....	....	
20,000	80,000	.028900	.002667	....	....	
20,500	82,000	.031833	.002933	....	....	
21,000	84,000	.035500	.003667	....	....	
21,500	86,000	.039233	.003733	....	....	
22,000	88,000	.045067	.005834	....	....	
22,500	90,000	.050000	.004933	....	....	
23,000	92,000	.058667	.008667	....	....	
23,500	94,000	.068333	.009666	....	....	Micrometer removed.
24,000	96,000	.0867	.018367	....	....	
24,250	97,000	.1300	.0433	....	....	Ultimate strength.
21,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8610
Hardness	19.93
Tensile strength per square inch of original section ... pounds	97,000
Elastic limit per square inch of original section ... do	49,000
Elongation per inch after rupture ... inch	0.1867
Elongation per inch under strain at elastic limit ... do	.001567
Reduction in diameter at point of rupture ... do	.124
Reduction in area after rupture, per centum of original section	39.2
Position of rupture	″.25 from middle of stem
Character of broken surface	granular, 60 per centum; dull eccentric spot, 40 per centum
Elongation of inch sections	″.12 (″.31 fractured section), ″.13

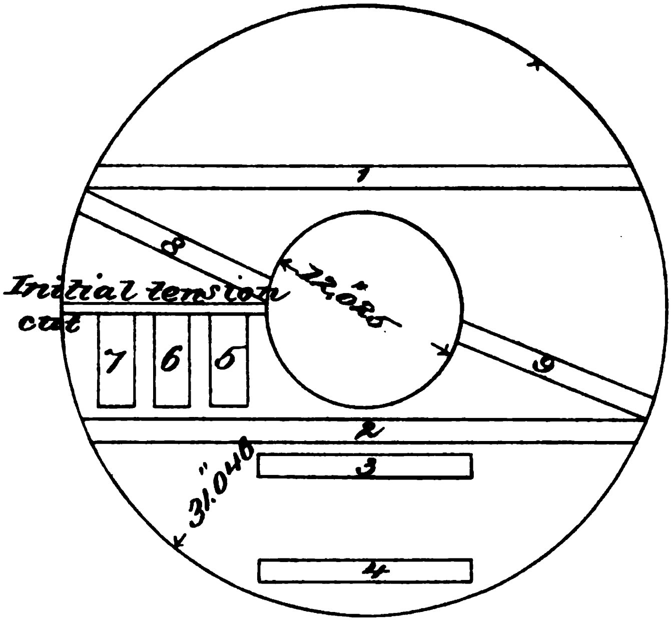
10.—12″ M. L. RIFLED MORTAR.

CAST IRON, HOOPED WITH STEEL.

[Cast-iron specimens from experimental cylinder, and steel specimens from trunnion hoop.]

12" M. L. Rifled Mortar
Cast Iron hooped with steel.

Experimental cylinder



Specimens taken out after experiment.

No. 425.

Tension Test.

Mark on bar, 1
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 20″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000010	.000010	0.	....	
2,000	2,000	.000070	.000060	0.	....	
3,000	3,000	.000120	.000050	0.	....	
4,000	4,000	.000170	.000050	0.	....	
5,000	5,000	.000230	.000060	.000005	.000005	
6,000	6,000	.000295	.000065	.000010	.000005	
7,000	7,000	.000345	.000050	.000020	.000010	
8,000	8,000	.000400	.000055	.000035	.000015	
9,000	9,000	.000470	.000070	.000045	.000010	
10,000	10,000	.000530	.000060	.000050	.000005	
11,000	11,000	.000600	.000070	.000055	.000005	
12,000	12,000	.000660	.000060	.000065	.000010	
13,000	13,000	.000750	.000090	.000095	.000030	
14,000	14,000	.000810	.000060	.000105	.000010	
15,000	15,000	.000910	.000100	.000140	.000035	
16,000	16,000	.001000	.000090	.000155	.000015	
17,000	17,000	.001100	.000100	.000190	.000035	
18,000	18,000	.001200	.000100	.000210	.000020	
19,000	19,000	.001300	.000100	.000260	.000050	
20,000	20,000	.001415	.000115	.000300	.000040	
21,000	21,000	.001550	.000135	.000355	.000055	
22,000	22,000	.001670	.000120	.000425	.000070	
23,000	23,000	.001840	.000170	.000515	.000090	
24,000	24,000	.002100	.000260	.000650	.000135	
25,000	25,000	.002310	.000210	.000815	.000165	
26,000	26,000	....	....	....	....	Ultimate strength.

General summary.

Specific gravity	7.2571
Hardness	14.83
Tensile strength per square inch of original section ....pounds..	26,000
Position of rupture	6″.50 from neck
Character of broken surface	coarse, granular, mottled

No. 426.

Tension Test.

Mark on bar, 2
Diameter, 1″.129.
Sectional area, 1 square inch.
Length, 20″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
1,000	1,000	.000010	.000010	0.	....	
2,000	2,000	.000060	.000050	0.	....	
3,000	3,000	.000110	.000050	0.	....	
4,000	4,000	.000170	.000060	0.	....	
5,000	5,000	.000220	.000050	0.	....	
6,000	6,000	.000275	.000055	0.	....	
7,000	7,000	.000340	.000065	.000005	.000005	
8,000	8,000	.000395	.000055	.000010	.000005	
9,000	9,000	.000445	.000050	.000015	.000005	
10,000	10,000	.000515	.000070	.000020	.000005	
11,000	11,000	.000580	.000065	.000045	.000025	
12,000	12,000	.000640	.000060	.000050	.000005	
13,000	13,000	.000715	.000075	.000065	.000015	
14,000	14,000	.000800	.000085	.000085	.000020	
15,000	15,000	.000865	.000065	.000100	.000015	
16,000	16,000	.000965	.000100	.000120	.000020	
17,000	17,000	.001050	.000085	.000150	.000030	
18,000	18,000	.001150	.000100	.000190	.000040	
19,000	19,000	.001230	.000080	.000205	.000015	
20,000	20,000	.001355	.000125	.000255	.000050	
21,000	21,000	.001480	.000125	.000305	.000050	
22,000	22,000	.001610	.000130	.000370	.000065	
23,000	23,000	.001750	.000140	.000445	.000075	
24,000	24,000	.001950	.000200	.000550	.000105	
25,000	25,000	.002130	.000180	.000655	.000105	
26,000	26,000	.002405	.000275	.000850	.000195	
27,000	27,000	.002695	.000290	.001095	.000245	
28,000	28,000	.003100	.000405	.001405	.000310	
28,940	28,940	....	....	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 28,940
Elastic limit per square inch of original section .... not well defined
Position of rupture .... 8″ from neck
Character of broken surface .... coarse, granular, mottled

No. 415.

Compression Test.

Mark on bar, 3
Length, 12″.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000070	.000070	0.	....	
3,000	3,000	.000110	.000040	0.	....	
4,000	4,000	.000170	.000060	.000020	.000020	
5,000	5,000	.000210	.000040	.000030	.000010	
6,000	6,000	.000260	.000050	.000040	.000010	
7,000	7,000	.000310	.000050	.000030	.000010	
8,000	8,000	.000360	.000050	.000060	.000010	
9,000	9,000	.000400	.000040	.000060	0.	
10,000	10,000	.000460	.000060	.000070	.000010	
11,000	11,000	.000510	.000050	.000070	0.	
12,000	12,000	.000560	.000050	.000070	0.	
13,000	13,000	.000610	.000050	.000070	0.	
14,000	14,000	.000680	.000070	.000080	.000010	
15,000	15,000	.000730	.000050	.000080	0.	
16,000	16,000	.000790	.000060	.000090	.000010	
17,000	17,000	.000850	.000060	.000090	0.	
18,000	18,000	.000900	.000050	.000100	.000010	
19,000	19,000	.000960	.000060	.000110	.000010	
20,000	20,000	.001030	.000070	.000130	.000020	
21,000	21,000	.001090	.000060	.000140	.000010	
22,000	22,000	.001170	.000080	.000150	.000010	
23,000	23,000	.001220	.000050	.000160	.000010	
24,000	24,000	.001300	.000080	.000180	.000020	
25,000	25,000	.001370	.000070	.000210	.000030	
26,000	26,000	.001450	.000080	.000220	.000010	
27,000	27,000	.001520	.000070	.000250	.000030	
28,000	28,000	.001600	.000080	.000270	.000020	
29,000	29,000	.001680	.000080	.000300	.000030	
30,000	30,000	.001770	.000090	.000350	.000050	
31,000	31,000	.001870	.000100	.000390	.000040	
32,000	32,000	.001980	.000110	.000450	.000060	
33,000	33,000	.002090	.000110	.000500	.000050	
34,000	34,000	.002250	.000160	.000590	.000090	
35,000	35,000	.002390	.000140	.000700	.000110	
36,000	36,000	.002590	.000200	.000840	.000140	
37,000	37,000	.002760	.000170	.000980	.000140	
38,000	38,000	.003020	.000260	.001180	.000200	Perceptible deflection.
39,000	39,000	.003250	.000230	.001360	.000180	
40,000	40,000	.003560	.000310	.001630	.000270	
53,700	53,700	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section ....pounds.. 53,700
Manner of failure .... triple flexure

No. 416.

Compression Test.

Mark on bar, 4
Length, 11''.985.
Diameter, 1''.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000030	.000030	0.	....	
3,000	3,000	.000080	.000050	0.	....	
4,000	4,000	.000120	.000040	0.	....	
5,000	5,000	.000180	.000060	0.	....	
6,000	6,000	.000220	.000040	0.	....	
7,000	7,000	.000280	.000060	0.	....	
8,000	8,000	.000310	.000030	0.	....	
9,000	9,000	.000370	.000060	0.	....	
10,000	10,000	.000410	.000040	0.	....	
11,000	11,000	.000460	.000050	0.	....	
12,000	12,000	.000500	.000040	0.	....	
13,000	13,000	.000560	.000060	0.	....	
14,000	14,000	.000610	.000050	0.	....	
15,000	15,000	.000680	.000070	.000010	.000010	
16,000	16,000	.000720	.000040	.000010	0.	
17,000	17,000	.000770	.000050	.000020	.000010	
18,000	18,000	.000830	.000060	.000030	.000010	
19,000	19,000	.000880	.000050	.000030	0.	
20,000	20,000	.000960	.000080	.000050	.000020	
21,000	21,000	.001020	.000060	.000070	.000020	
22,000	22,000	.001080	.000060	.000080	.000010	
23,000	23,000	.001130	.000050	.000090	.000010	
24,000	24,000	.001200	.000070	.000100	.000010	
25,000	25,000	.001270	.000070	.000110	.000010	
26,000	26,000	.001340	.000070	.000130	.000020	
27,000	27,000	.001430	.000090	.000150	.000020	
28,000	28,000	001500	.000070	.000170	.000020	
29,000	29,000	.001580	.000080	.000200	.000030	
30,000	30,000	.001670	.000090	.000220	.000020	
31,000	31,000	.001760	.000090	.000270	.000050	
32,000	32,000	.001860	.000100	.000320	.000050	
33,000	33,000	.001950	.000090	.000370	.000050	
34,000	34,000	.002070	.000120	.000420	.000050	
35,000	35,000	.002220	.000150	.000520	.000100	
36,000	36,000	.002360	.000140	.000610	.000090	
37,000	37,000	.002570	.000210	.000770	.000160	Perceptible deflection.
38,000	38,000	.002700	.000130	.000840	.000070	
39,000	39,000	.002920	.000220	.001050	.000210	
40,000	40,000	.003200	.000280	.001230	.000180	
54,250	54,250	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section................................pounds.. 54,250
Manner of failure ....triple flexure

No. 417.

Compression Test.

Mark on bar, 8.
Length, 9″.068.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000033	.000033	0.	....	
3,000	3,000	.000067	.000034	0.	....	
4,000	4,000	.000133	.000066	0.	....	
5,000	5,000	.000183	.000050	0.	....	
6,000	6,000	.000233	.000050	0.	....	
7,000	7,000	.000301	.000068	0.	....	
8,000	8,000	.000333	.000032	0.	....	
9,000	9,000	.000383	.000050	0.	....	
10,000	10,000	.000433	.000050	0.	....	
11,000	11,000	.000483	.000050	.000017	.000017	
12,000	12,000	.000533	.000050	.000017	0.	
13,000	13,000	.000583	.000050	.000017	0.	
14,000	14,000	.000633	.000050	.000033	.000016	
15,000	15,000	.000700	.000067	.000033	0.	
16,000	16,000	.000733	.000033	.000033	0.	
17,000	17,000	.000817	.000084	.000050	.000017	
18,000	18,000	.000867	.000050	.000050	0.	
19,000	19,000	.000917	.000050	.000050	0.	
20,000	20,000	.001000	.000083	.000067	.000017	
21,000	21,000	.001050	.000050	.000067	0.	
22,000	22,000	.001133	.000083	.000083	.000016	
23,000	23,000	.001183	.000050	.000083	0.	
24,000	24,000	.001233	.000050	.000100	.000017	
25,000	25,000	.001317	.000084	.000117	.000017	
26,000	26,000	.001383	.000066	.000133	.000016	
27,000	27,000	.001450	.000067	.000167	.000034	
28,000	28,000	.001533	.000083	.000217	.000050	
29,000	29,000	.001617	.000084	.000250	.000033	
30,000	30,000	.001700	.000083	.000300	.000050	
31,000	31,000	.001817	.000117	.000317	.000017	
32,000	32,000	.001883	.000066	.000350	.000033	
33,000	33,000	.002017	.000134	.000433	.000083	
34,000	34,000	.002133	.000116	.000483	.000050	
35,000	35,000	.002300	.000167	.000567	.000084	
36,000	36,000	.002467	.000167	.000700	.000133	
37,000	37,000	.002633	.000166	.000817	.000117	Perceptible deflection.
38,000	38,000	.002817	.000184	.000933	.000116	
39,000	39,000	.003050	.000233	.001150	.000217	
40,000	40,000	.003300	.000250	.001317	.000167	
66,550	66,550	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section.. 66,550
Manner of failure ....triple flexure

No. 418.

Compression Test.

Mark on bar, 9
Length, 9''.062.
Diameter, 1''.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
2,000	2,000	.000083	.000083	0.	....	
3,000	3,000	.000150	.000067	0.	....	
4,000	4,000	.000183	.000033	0.	....	
5,000	5,000	.000250	.000067	.000017	.000017	
6,000	6,000	.000300	.000050	.000033	.000016	
7,000	7,000	.000350	.000050	.000050	.000017	
8,000	8,000	.000383	.000033	.000050	0.	
9,000	9,000	.000450	.000067	.000050	0.	
10,000	10,000	.000517	.000067	.000067	.000017	
11,000	11,000	.000567	.000050	.000067	0.	
12,000	12,000	.000617	.000050	.000067	0.	
13,000	13,000	.000650	.000033	.000067	0.	
14,000	14,000	.000750	.000100	.000083	.000016	
15,000	15,000	.000800	.000050	.000083	0.	
16,000	16,000	.000850	.000050	.000100	.000017	
17,000	17,000	.000917	.000067	.000117	.000017	
18,000	18,000	.000983	.000066	.000133	.000016	
19,000	19,000	.001033	.000050	.000133	0.	
20,000	20,000	.001117	.000084	.000150	.000017	
21,000	21,000	.001183	.000066	.000150	0.	
22,000	22,000	.001233	.000050	.000167	.000017	
23,000	23,000	.001300	.000067	.000167	0.	
24,000	24,000	.001383	.000083	.000200	.000033	
25,000	25,000	.001450	.000067	.000233	.000033	
26,000	26,000	.001533	.000083	.000283	.000050	
27,000	27,000	.001650	.000117	.000317	.000034	
28,000	28,000	.001733	.000083	.000333	.000016	
29,000	29,000	.001833	.000100	.000383	.000050	
30,000	30,000	.001900	.000067	.000417	.000034	
31,000	31,000	.002017	.000117	.000483	.000066	
32,000	32,000	.002133	.000116	.000550	.000067	
33,000	33,000	.002300	.000167	.000633	.000083	
34,000	34,000	.002467	.000167	.000733	.000100	
35,000	35,000	.002633	.000166	.000867	.000134	
36,000	36,000	.002800	.000167	.001000	.000133	
37,000	37,000	.003083	.000283	.001200	.000200	
38,000	38,000	.003300	.000217	.001400	.000200	
39,000	39,000	.003650	.000350	.001717	.000317	
40,000	40,000	.004033	.000383	.002000	.000283	Perceptible deflection.
62,800	62,800	....	....	....	....	Ultimate strength.

General summary.

Ultimate strength per square inch of original section .... pounds.. 62,800
Manner of failure .... triple flexure

No. 317.

Tension Test.

Marks on bar, $^{12\text{ in }M}_{1972}$
Diameter, ".564.
Sectional area, .25 square inch.
Length, 6".

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	.000050	.000050	
2,500	10,000	.000500	.000333	.000267	.000217	
3,750	15,000	.000650	.000150	.000267	0.	
5,000	20,000	.000850	.000200	.000317	.000050	
6,250	25,000	.001133	.000283	.000400	.000083	
7,500	30,000	.001483	.000350	.000566	.000166	
7,750	31,000	.001518	.000035	....	....	
8,000	32,000	.001550	.000032	....	....	
8,250	33,000	.001600	.000050	....	....	
8,500	34,000	.001716	.000116	....	....	
8,750	35,000	.001783	.000067	.000750	.000184	
9,000	36,000	.001883	.000100	....	....	
9,250	37,000	.001950	.000067	....	....	
9,500	38,000	.002033	.000083	....	....	
9,750	39,000	.002150	.000117	....	....	
10,000	40,000	.002200	.000050	.000983	.000233	
10,250	41,000	.002333	.000133	....	....	
10,500	42,000	.002466	.000133	....	....	
10,750	43,000	.002533	.000067	....	....	Probable elastic limit.
11,000	44,000	.002650	.000117	....	....	
11,250	45,000	.002866	.000216	.001433	.000450	
11,500	46,000	.003016	.000150	....	....	
11,750	47,000	.003200	.000184	....	....	
12,000	48,000	.003500	.000300	....	....	
12,250	49,000	.003683	.000183	....	....	
12,500	50,000	.004066	.000383	.002383	.000950	
12,750	51,000	.004316	.000250	....	....	
13,000	52,000	.004666	.000350	....	....	
13,250	53,000	.004933	.000267	....	....	
13,500	54,000	.005633	.000700	....	....	
13,750	55,000	.006016	.000383	.004066	.001683	
14,000	56,000	.006550	.000534	....	....	
14,250	57,000	.006916	.000366	....	....	
14,500	58,000	.007983	.001067	....	....	
14,750	59,000	.008566	.000583	....	....	
15,000	60,000	.009466	.000900	.007188	.003117	
15,250	61,000	.009866	.000400	....	....	
15,500	62,000	.010900	.001034	....	....	
15,750	63,000	.011366	.000466	....	....	
16,000	64,000	.012566	.001200	....	....	
16,250	65,000	.013400	.000834	.010916	.003733	
16,500	66,000	.014450	.001050	....	....	
16,750	67,000	.015150	.000700	....	....	
17,000	68,000	.016633	.001483	....	....	
17,250	69,000	.017833	.001200	....	....	
17,500	70,000	.019533	.001700	.016683	.005767	
18,000	72,000	.020883	.001350	....	....	
18,500	74,000	.024066	.003183	....	....	
19,000	76,000	.026233	.002167	....	....	
19,500	78,000	.030066	.003833	....	....	
20,000	80,000	.033500	.003434	....	....	Micrometer removed.
20,500	82,000	.0417	.0082	....	....	
21,000	84,000	.0450	.0033	....	....	
21,500	86,000	.0500	.0050	....	....	
22,000	88,000	.0583	.0083	....	....	
22,500	90,000	.0658	.0075	....	....	
23,000	92,000	.0783	.0125	....	....	
23,500	94,000	.0983	.0200	....	....	
23,680	94,720	.1183 .1400	.0200 .0217	....	....	Ultimate strength.
20,450	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8635
Hardness	21.65
Tensile strength per square inch of original section......pounds..	94,720
Elastic limit per square inch of original section (probable)......do...	43,000
Elongation per inch after rupture......inch..	0.175
Elongation per inch under strain at elastic limit......do...	.02533
Reduction in diameter at point of rupture......do...	.154
Reduction in area after rupture, per centum of original section	47.2
Position of rupture	".25 from middle of stem
Character of broken surface	fine silky; cup-shaped ends
Elongation of inch sections	".09, ".15, "18 (".37 fractured section), ".16, ".10

No. 318.

Tension Test.

Marks on bar, $^{12\text{ in M}}_{1972}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000116	.000116	0.	....	
2,500	10,000	.000283	.000167	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000600	.000167	.000016	.000016	
6,250	25,000	.000816	.000216	.000116	.000100	
6,500	26,000	.000866	.000050	....	....	
6,750	27,000	.000900	.000034	....	....	
7,000	28,000	.000982	.000082	....	....	
7,250	29,000	.000982	0.	....	....	
7,500	30,000	.001016	.000034	.000133	.000017	
7,750	31,000	.001066	.000050	....	....	
8,000	32,000	.001150	.000084	....	....	
8,250	33,000	.001183	.000033	....	....	
8,500	34,000	.001233	.000050	....	....	
8,750	35,000	.001283	.000050	.000200	.000067	
9,000	36,000	.001333	.000050	....	....	
9,250	37,000	.001350	.000017	....	....	
9,500	38,000	.001450	.000100	....	....	
9,750	39,000	.001500	.000050	....	....	
10,000	40,000	.001533	.000033	.000316	.000116	
10,250	41,000	.001633	.000100	....	....	
10,500	42,000	.001666	.000033	....	....	
10,750	43,000	.001716	.000050	....	....	
11,000	44,000	.001783	.000067	....	....	
11,250	45,000	.001833	.000050	.000450	.000184	
11,500	46,000	.001916	.000083	....	....	
11,750	47,000	.001983	.000067	....	....	
12,000	48,000	.002083	.000100	....	....	
12,250	49,000	.002150	.000067	....	....	
12,500	50,000	.002250	.000100	.000666	.000216	
12,750	51,000	.002366	.000116	....	....	
13,000	52,000	.002433	.000067	....	....	Elastic limit.
13,250	53,000	.002600	.000167	....	....	
13,500	54,000	.002816	.000216	....	....	
13,750	55,000	.002983	.000167	.001183	.000517	
14,000	56,000	.003183	.000200	....	....	
14,250	57,000	.003450	.000267	....	....	
14,500	58,000	.003783	.000333	....	....	
14,750	59,000	.004150	.000367	....	....	
15,000	60,000	.004616	.000466	.002933	.001750	
15,250	61,000	.005016	.000400	....	....	
15,500	62,000	.005783	.000767	....	....	
15,750	63,000	.006283	.000500	....	....	
16,000	64,000	.007033	.000750	....	....	
16,250	65,000	.007913	.000880	.005550	.002617	
16,500	66,000	.008566	.000653	....	....	
16,750	67,000	.009316	.000750	....	....	
17,000	68,000	.010466	.001150	....	....	
17,250	69,000	.011250	.000784	....	....	
17,500	70,000	.012483	.001233	.009813	.004263	
18,000	72,000	.013883	.001400	....	....	
18,500	74,000	.016050	.002167	....	....	
19,000	76,000	.018383	.002333	....	....	
19,500	78,000	.020733	.002350	....	....	
20,000	80,000	.023333	.002600	....	....	
20,500	82,000	.026083	.002750	....	....	
21,000	84,000	.029083	.003000	....	....	
21,500	86,000	.032483	.003400	....	....	
22,000	88,000	.036333	.003850	....	....	
22,500	90,000	.040400	.004067	....	....	Micrometer removed.
23,000	92,000	.0450	.0046	....	....	
23,500	94,000	.0517	.0067	....	....	
24,000	96,000	.0613	.0096	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24, 500	98, 000	.0717	.0104	....	....	
25, 000	100, 000	.0900	.0183	....	....	
25, 140	100, 560	.1083	.0183	....	....	Ultimate strength.
22, 600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................................pounds.. 100, 560
Elastic limit per square inch of original section....................................do.... 52, 000
Elongation per inch after rupture....................................inch.. 0. 1433
Elongation per inch under strain at elastic limit....................................do.... .002433
Reduction in diameter at point of rupture....................................do.... 0. 124
Reduction in area after rupture, per centum of original section 39. 2
Position of rupture....................................2″ from neck
Character of broken surface, dull, spongy center, 60 per centum; fine granular at circumference, 40 per centum.
Elongation of inch sections....................................″.09 (″.29 fractured section), ″.14, ″.15, ″.11, ″08

No. 319.

Tension Test.

Marks on bar, $^{12\text{ in M}}_{1972}$
Diameter, ″.564.
Sectional area, .25 square inch.
Length, 6″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000083	.000083	0.	....	
2, 500	10, 000	.000217	.000134	0.	....	
3, 750	15, 000	.000350	.000133	—.000066	— .000066	
5, 000	20, 000	.000516	.000166	—.000066	0.	
6, 250	25, 000	.000733	.000217	.000033	.000099	
6, 500	26, 000	.000766	.000033	....	....	
6, 750	27, 000	.000833	.000067	....	....	
7, 000	28, 000	.000883	.000050	....	....	
7, 250	29, 000	.000916	.000033	....	....	
7, 500	30, 000	.000950	.000034	.000100	.000067	
7, 750	31, 000	.000966	.000016	....	....	
8, 000	32, 000	.001033	.000067	....	....	
8, 250	33, 000	.001083	.000050	....	....	
8, 500	34, 000	.001150	.000067	....	....	
8, 750	35, 000	.001233	.000083	.000166	.000066	
9, 000	36, 000	.001283	.000050	....	....	
9, 250	37, 000	.001316	.000033	....	....	
9, 500	38, 000	.001400	.000084	....	....	
9, 750	39, 000	.001416	.000016	....	....	
10, 000	40, 000	.001516	.000100	.000266	.000100	
10, 250	41, 000	.001566	.000050	....	....	
10, 500	42, 000	.001610	.000044	....	....	
10, 750	43, 000	.001700	.000090	....	....	
11, 000	44, 000	.001766	.000066	....	....	
11, 250	45, 000	.001800	.000034	.000416	.000150	
11, 500	46, 000	.001900	.000100	....	....	
11, 750	47, 000	.001966	.000066	....	....	
12, 000	48, 000	.002116	.000150	....	....	
12, 250	49, 000	.002183	.000067	....	....	
12, 500	50, 000	.002283	.000100	.000716	.000300	Elastic limit.
12, 750	51, 000	.002416	.000133	....	....	
13, 000	52, 000	.002583	.000167	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
13,250	53,000	.002700	.000117	....	....	
13,500	54,000	.002983	.000283	....	....	
13,750	55,000	.003183	.000200	.001416	.000700	
14,000	56,000	.003483	.000300	....	....	
14,250	57,000	.003716	.000233	....	....	
14,500	58,000	.004283	.000567	....	....	
14,750	59,000	.004800	.000517	....	....	
15,000	60,000	.005516	.000716	.003416	.002000	
15,250	61,000	.005783	.000267	....	....	
15,500	62,000	.006633	.000850	....	....	
15,750	63,000	.007233	.000600	....	....	
16,000	64,000	.008133	.000900	....	....	
16,250	65,000	.008983	.000850	.006583	.003167	
16,500	66,000	.009766	.000783	....	....	
16,750	67,000	.010583	.000817	....	....	
17,000	68,000	.011583	.001000	....	....	
17,250	69,000	.012350	.000767	....	....	
17,500	70,000	.013750	.001400	.011833	.005250	
18,000	72,000	.015383	.001633	....	....	
18,500	74,000	.017716	.002333	....	....	
19,000	76,000	.020283	.002567	....	....	
19,500	78,000	.022600	.002317	....	....	
20,000	80,000	.025316	.002716	....	....	
20,500	82,000	.028333	.003017	....	....	
21,000	84,000	.031716	.003383	....	....	
21,500	86,000	.035333	.003617	....	....	
22,000	88,000	.038833	.003500	....	....	
22,500	90,000	.043583	.004750	....	....	
23,000	92,000	.0500	.006417	....	....	
23,500	94,000	.0583	.0083	....	....	
24,000	96,000	.0717	.0134	....	....	
24,250	97,000	.0817	.0100	....	....	
24,500	98,000	.0917 .1017	.0100 .0100	....	....	Ultimate strength.
21,380	....	....	....	....	....	Load at time of rupture.

General summary.

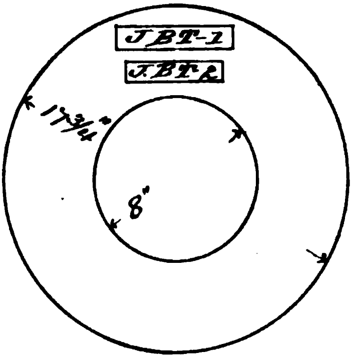
Tensile strength per square inch of original section	pounds..	98,000
Elastic limit per square inch of original section	do....	49,000
Elongation per inch after rupture	inch..	0.135
Elongation per inch under strain at elastic limit	do....	.002183
Reduction in diameter at point of rupture	do....	.144
Reduction in area after rupture, per centum of original section		44.6
Position of rupture		1''.85 from neck
Character of broken surface, dull, smoky center, 60 per centum; fine granular at circumference, 40 per centum.		
Elongation of inch sections		''.05, ''.07, ''.10, ''.13 (''.34 fractured section), ''.12

11.—STEEL SPECIMENS FROM JACKET FOR 6″ STEEL RIFLE FOR UNITED STATES NAVY DEPARTMENT.

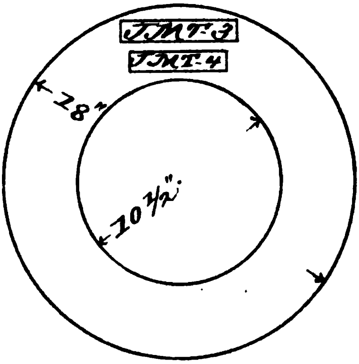
6 inch Steel Rifle
U.S. Navy Dept.

Jacket

Breech



Muzzle



No 435.

Tension Test.

Marks on bar, $^{J\,\frac{B}{1}\,T}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
25	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000667	.000100	0.	....	
7,500	30,000	.000867	.000200	0.	....	
8,750	35,000	.000967	.000100	0.	....	
10,000	40,000	.001167	.000200	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	
12,000	48,000	.001433	.000033	....	....	
12,250	49,000	.001500	.000067	....	....	Elastic limit.
12,500	50,000	.001700	.000200	.000100	.000100	
12,750	51,000	.002033	.000333	....	....	
13,000	52,000	.002300	.000267	....	....	
13,250	53,000	.002600	.000300	....	....	
13,500	54,000	.003967	.001367	....	....	
13,750	55,000	.004433	.000466	.002567	.002467	
14,000	56,000	.005400	.000967	....	....	
14,250	57,000	.006067	.000667	....	....	
14,500	58,000	.007333	.001266	....	....	
11,750	59,000	.008167	.000834	....	....	
15,000	60,000	.009300	.001133	.007067	.004500	
15,500	62,000	.010967	.001667	....	....	
16,000	64,000	.013333	.002366	....	....	
16,500	66,000	.015500	.002167	....	....	
17,000	68,000	.017700	.002200	....	....	
17,500	70,000	.020333	.002633	....	....	
18,000	72,000	.022667	.002334	....	....	
18,500	74,000	.025667	.003000	....	....	
19,000	76,000	.028667	.003000	....	....	
19,500	78,000	.032667	.004000	....	....	
20,000	80,000	.036333	.003666	....	....	
20,500	82,000	.041000	.004667	....	....	
21,000	84,000	.046333	.005333	....	....	
21,500	86,000	.053667	.007334	....	....	
22,000	88,000	.064000	.010333	....	....	
22,500	90,000	.078333	.014333	....	....	
22,990	91,960	.1233	.044967	....	....	Ultimate strength.
18,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8621
Hardness	18.68
Tensile strength per square inch of original section ... pounds	91,960
Elastic limit per square inch of original section ... do	49,000
Elongation per inch after rupture ... inch	0.2067
Elongation per inch under strain at elastic limit ... do	.001500
Reduction in diameter at point of rupture ... do	.134
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	".50 from middle of stem
Character of broken surface	granular, 40 per centum; dull, spongy, 60 per centum
Elongation of inch sections	".13 (".29 fractured section), ".20

No. 437.

Tension Test.

Marks on bar, J B T 2
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000050	.000050	0.	....	
2,500	10,000	.000200	.000150	0.	....	
3,750	15,000	.000350	.000150	0.	....	
5,000	20,000	.000550	.000200	0.	....	
6,250	25,000	.000700	.000150	0.	....	
7,500	30,000	.000900	.000200	0.	....	
8,750	35,000	.001050	.000150	0.	....	
10,000	40,000	.001350	.000300	.000100	.000100	
10,250	41,000	.001500	.000150	....	....	Elastic limit.
10,500	42,000	.001950	.000450	....	....	
10,750	43,000	.002400	.000450	....	....	
11,000	44,000	.003250	.000850	....	....	
11,250	45,000	.003900	.000650	.002450	.002350	
11,500	46,000	.004700	.000800	....	....	
11,750	47,000	.005600	.000900	....	....	
12,000	48,000	.006400	.000800	....	....	
12,250	49,000	.007600	.001200	....	....	
12,500	50,000	.008750	.001150	.006900	.004450	
12,750	51,000	.009300	.000550	....	....	
13,000	52,000	.010100	.000800	....	....	
13,250	53,000	.010900	.000800	....	....	
13,500	54,000	.011700	.000800	....	....	
13,750	55,000	.013150	.001450	.011400	.004500	
14,000	56,000	.014350	.001200	....	....	
14,250	57,000	.015000	.000650	....	....	
14,500	58,000	.016600	.001600	....	....	
14,750	59,000	.017450	.000850	....	....	
15,000	60,000	.019000	.001550	.016700	.005300	
15,500	62,000	.020900	.001900	....	....	
16,000	64,000	.024000	.003100	....	....	
16,500	66,000	.027000	.003000	....	....	
17,000	68,000	.030000	.003000	....	....	
17,500	70,000	.033550	.003550	....	....	
18,000	72,000	.037500	.003950	....	....	
18,500	74,000	.042000	.004500	....	....	
19,000	76,000	.047500	.005500	....	....	
19,500	78,000	.055000	.007500	....	....	
20,000	80,000	.063250	.008250	....	....	
20,500	82,000	.075500	.012250	....	....	
21,000	84,000	.095000	.019500	....	....	
21,400	85,600	.1600	.0650	....	....	Ultimate strength.
18,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	85,600
Elastic limit per square inch of original section	do ...	41,000
Elongation per inch after rupture	inch..	0.2850
Elongation per inch under strain at elastic limit	do ...	.001500
Reduction in diameter at point of rupture	do ...	.164
Reduction in area after rupture, per centum of original section		49.7
Position of rupture		at middle of stem
Character of broken surface		dull, spongy; irregular surface

No. 436.

Tension Test.

Marks on bar, J $\underset{8}{\text{M}}$ T
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000167	.000167	0.	....	
2,500	10,000	.000333	.000166	0.	....	
3,750	15,000	.000500	.000167	0.	....	
5,000	20,000	.000667	.000167	0.	....	
6,250	25,000	.000833	.000166	0.	....	
7,500	30,000	.000967	.000134	0.	....	
8,750	35,000	.001133	.000166	.000033	.000033	
10,000	40,000	.001267	.000134	.000067	.000034	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	Elastic limit.
11,250	45,000	.001533	.000133	.000167	.000100	
11,500	46,000	.001700	.000167	....	....	
11,750	47,000	.002033	.000333	....	....	
12,000	48,000	.002567	.000534	....	....	
12,250	49,000	.003267	.000700	....	....	
12,500	50,000	.004900	.001633	.003167	.003000	
12,750	51,000	.005367	.000467	....	....	
13,000	52,000	.006333	.000966	....	....	
13,250	53,000	.007267	.000934	....	....	
13,500	54,000	.008500	.001233	....	....	
13,750	55,000	.009567	.001067	.007467	.004300	
14,000	56,000	.010400	.000833	....	....	
14,250	57,000	.011067	.000667	....	....	
14,500	58,000	.012333	.001266	....	....	
14,750	59,000	.013333	.001000	....	....	
15,000	60,000	.014733	.001400	.012467	.005000	
15,500	62,000	.016500	.001767	....	....	
16,000	64,000	.019067	.002567	....	....	
16,500	66,000	.021667	.002600	....	....	
17,000	68,000	.024667	.003000	....	....	
17,500	70,000	.027933	.003266	....	....	
18,000	72,000	.031333	.003400	....	....	
18,500	74,000	.035000	.003667	....	....	
19,000	76,000	.039667	.004667	....	....	
19,500	78,000	.045000	.005333	....	....	
20,000	80,000	.051833	.006333	....	....	
20,500	82,000	.060000	.008667	....	....	
21,000	84,000	.071667	.011667	....	....	
21,500	86,000	.0933	.021633	....	....	
21,950	87,800	.1000	.0667	....	....	Ultimate strength.
19,000	....	....	....	....	....	Load at time of rupture

General summary.

Specific gravity	7.8617
Hardness	16.15
Tensile strength per square inch of original section ......pounds..	87,800
Elastic limit per square inch of original section ......do....	44,000
Elongation per inch after rupture ......inch..	0.2200
Elongation per inch under strain at elastic limit ......do....	.001400
Reduction in diameter at point of rupture ......do....	.184
Reduction in area after rupture, per centum of original section	41.9
Position of rupture	″.75 from neck
Character of broken surface	granular, 60 per centum; dull spongy at circumference, 40 per centum
Elongation of inch sections	″.17, ″.14, (″.35 fractional section

No. 438.

Tension Test.

Marks on bar, $^{J\ \underset{4}{M}\ T}$
Diameter, ″ 564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000300	.000150	0.	....	
3,750	15,000	.000400	.000100	0.	....	
5,000	20,000	.000500	.000100	0.	....	
6,250	25,000	.000600	.000100	0.	....	
7,500	30,000	.000800	.000200	0.	....	
8,750	35,000	.000950	.000150	0.	....	
10,000	40,000	.001150	.000200	0.	....	
10,250	41,000	.001200	.000050	....	....	
10,500	42,000	.001250	.000050	....	....	
10,750	43,000	.001300	.000050	....	....	
11,000	44,000	.001400	.000100	....	....	
11,250	45,000	.001500	.000100	.000050	.000050	
11,500	46,000	.001600	.000100	....	....	
11,750	47,000	.001700	.000100	....	....	Elastic limit.
12,000	48,000	.002150	.000450	....	....	
12,250	49,000	.002600	.000450	....	....	
12,500	50,000	.003950	.001350	.002300	.002250	
12,750	51,000	.004300	.000350	....	....	
13,000	52,000	.005100	.000800	....	....	
13,250	53,000	.006250	.001150	....	....	
13,500	54,000	.007350	.001100	....	....	
13,750	55,000	.008250	.000900	.006250	.003950	
14,000	56,000	.009650	.001400	....	....	
14,250	57,000	.010000	.000350	....	....	
14,500	58,000	.011150	.001150	....	....	
14,750	59,000	.012350	.001200	....	....	
15,000	60,000	.013150	.000800	.010900	.004650	
15,500	62,000	.015250	.002100	....	....	
16,000	64,000	.017000	.001750	....	....	
16,500	66,000	.019750	.002750	....	....	
17,000	68,000	.022250	.002500	....	....	
17,500	70,000	.024800	.002550	....	....	
18,000	72,000	.028000	.003200	....	....	
18,500	74,000	.031500	.003500	....	....	
19,000	76,000	.035000	.003500	....	....	
19,500	78,000	.039500	.004500	....	....	
20,000	80,000	.044500	.005000	....	....	
20,500	82,000	.051000	.006500	....	....	
21,000	84,000	.059500	.008500	....	....	
21,500	86,000	.071500	.012000	....	....	
22,000	88,000	.091250	.019750	....	....	
22,320	89,280	.1350	.043750	....	....	Ultimate strength.
21,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	89,280
Elastic limit per square inch of original section	do...	47,000
Elongation per inch after rupture	inch..	0.1700
Elongation per inch under strain at elastic limit	do...	.001700
Reduction in diameter at point of rupture	do...	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		at neck
Character of broken surface		granular

The greatest reduction in diameter occurred ½-inch from the point of rupture.

12.—6½″ MANN GUN.

[Steel specimens from breech hoop, retaining ring, side straps, and transom.]

No. 394.

Tension Test.

Marks on bar, $^{\text{B}}\overset{\text{H}_1}{\text{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000183	.000183	0.	....	
2,500	10,000	.000267	.000184	0.	....	
3,780	15,000	.000400	.000133	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000933	.002000	0.	....	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001000	0.	....	....	
8,500	34,000	.001033	.000033	....	....	
8,750	35,000	.001067	.000034	0.	....	
9,000	36,000	.001133	.000066	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	0.	....	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001400	.000033	....	....	
11,250	45,000	.001400	0.	.000033	.000033	
11,500	46,000	.001433	.000033	....	....	
11,750	47,000	.001467	.000034	....	....	
12,000	48,000	.001500	.000033	....	....	
12,250	49,000	.001533	.000033	....	....	
12,500	50,000	.001600	.000067	.000033	0.	
12,750	51,000	.001633	.000033	....	....	
13,000	52,000	.001667	.000034	....	....	
13,250	53,000	.001700	.000033	....	....	
13,500	54,000	.001733	.000033	....	....	
13,750	55,000	.001767	.000034	.000067	.000034	
14,000	56,000	.001800	.000033	....	....	
14,250	57,000	.001833	.000033	....	....	
14,500	58,000	.001900	.000067	....	....	
14,750	59,000	.001933	.000033	....	....	
15,000	60,000	.002033	.000100	.000067	0.	
15,250	61,000	.002067	.000034	....	....	Elastic limit.

The tensile stress fell 4,000 pounds per square inch, while the elongation increased ″.0022 per inch.

Total.	Per square inch.	Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
14,250	57,000	.004267	.002200	....	....	
14,500	58,000	.006767	.002500	....	....	
14,750	59,000	.012300	.005533	....	....	
15,000	60,000	.012333	.000033	....	....	
15,250	61,000	.012700	.000367	....	....	
15,500	62,000	.013967	.001267	....	....	
15,750	63,000	.015033	.001066	....	....	
16,000	64,000	.015767	.000734	....	....	
16,250	65,000	.016900	.001133	.014267	.014200	
16,500	66,000	.018367	.001467	....	....	
16,750	67,000	.019267	.000900	....	....	
17,000	68,000	.020733	.001466	....	....	
17,250	69,000	.021733	.001000	....	....	
17,500	70,000	.023667	.001934	.020733	.006466	
18,000	72,000	.025967	.002300	....	....	
18,500	74,000	.029667	.003700	....	....	
19,000	76,000	.033500	.003833	....	....	
19,500	78,000	.037333	.003833	....	....	
20,000	80,000	.042333	.005000	....	....	
20.500	82,000	.051700	.009367	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
21,000	84,000	.055700	.004000	....	....	
21,500	86,000	.066667	.010967	....	....	Micrometer removed.
22,000	88,000	.0833	.016633	....	....	
22,500	90,000	.1133	.0300	....	....	Ultimate strength.

General summary.

Specific gravity		7.8643
Hardness		20.59
Tensile strength per square inch of original section	pounds	90,000
Elastic limit per square inch of original section	do	61,000
Elongation per inch after rupture	inch	0.1500
Elongation per inch under strain of elastic limit	do	.002067
Reduction in diameter at point of rupture	do	.084
Reduction in area after rupture, per centum of original section		27.6
Position of rupture		".75 from neck
Character of broken surface		silky; contains spots of different colors; fractured obliquely
Elongation of inch sections		".11, ".18 (".27 fractured section)

No. 395.

Tension Test.

Marks on bar, $^{\mathrm{B\,H_3}}_{\mathrm{M}}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000133	.000133	0.	....	
2,500	10,000	.000233	.000100	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000567	.000200	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
7,750	31,000	.000933	.000033	....	....	
8,000	32,000	.000967	.000034	....	....	
8,250	33,000	.000967	0.	....	....	
8,500	34,000	.001000	.000033	....	....	
8,750	35,000	.001033	.000033	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001200	.000033	0.	....	
10,250	41,000	.001233	.000033	....	....	
10,500	42,000	.001267	.000034	....	....	
10,750	43,000	.001300	.000033	....	....	
11,000	44,000	.001333	.000033	....	....	
11,250	45,000	.001367	.000034	0.	....	
11,500	46,000	.001400	.000033	....	....	
11,750	47,000	.001433	.000033	....	....	
12,000	48,000	.001467	.000034	....	....	
12,250	49,000	.001500	.000033	....	....	
12,500	50,000	.001533	.000033	.000033	.000033	
12,750	51,000	.001600	.000067	....	....	
13,000	52,000	.001633	.000033	....	....	
13,250	53,000	.001667	.000034	....	....	
13,500	54,000	.001700	.000033	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
13,750	55,000	.001733	.000033	.000033	0.	
14,000	56,000	.001833	.000100	....	....	
14,250	57,000	.001900	.000067	....	....	Elastic limit.
The tensile stress fell 4,000 pounds per square inch, while the elongation increased ".0048 per inch.						
13,250	53,000	.006700	.004800	....	....	
13,500	54,000	.010000	.003300	....	....	
13,750	55,000	.010667	.000667	....	....	
14,000	56,000	.011633	.000966	....	....	
14,250	57,000	.012367	.000734	....	....	
14,500	58,000	.013500	.001133	....	....	
14,750	59,000	.014167	.000667	....	....	
15,000	60,000	.015667	.001500	.013300	.013267	
15,250	61,000	.016567	.000900	....	....	
15,500	62,000	.017367	.000800	....	....	
15,750	63,000	.018600	.001233	....	....	
16,000	64,000	.020167	.001567	....	....	
16,250	65,000	.021933	.001766	.010167	.003867	
16,500	66,000	.023067	.001134	....	....	
16,750	67,000	.024000	.000933	....	....	
17,000	68,000	.026000	.002000	....	....	
17,250	69,000	.027400	.001400	....	....	
17,500	70,000	.029467	.002067	.026567	.007400	
18,000	72,000	.033000	.003533	....	....	
18,500	74,000	.037333	.004333	....	....	
19,000	76,000	.042167	.004834	....	....	
19,500	78,000	.048267	.006100	....	....	
20,000	80,000	.057267	.009000	....	....	Micrometer removed.
20,500	82,000	.0667	.009433	....	....	
21,000	84,000	.0833	.0166	....	....	
21,500	86,000	.1100	.0267	....	....	
21,780	87,120	.1567	.0467	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section..........pounds..	87,120
Elastic limit per square inch of original section..........do...	57,000
Elongation per inch after rupture..........inch..	0.1900
Elongation per inch under strain at elastic limit..........do...	.001900
Reduction in diameter at point of rupture..........do...	.094
Reduction in area after rupture, per centum of original section..........	30.6
Position of rupture..........	".25 from neck
Character of broken surface..........silky; contains spots of different colors; oblique fracture	
Elongation of inch sections..........	".15, ".16 (".26 fractured section)

No. 396.

Tension Test.

Marks on bar, R R_1
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000667	.000134	0.	....	
7,500	30,000	.000867	.000200	0.	....	
7,750	31,000	.000900	.000033	....	....	
8,000	32,000	.000933	.000033	....	....	
8,250	33,000	.000967	.000034	....	....	
8,500	34,000	.001000	.000033	....	....	
8,750	35,000	.001033	.000033	0.	....	
9,000	36,000	.001067	.000034	....	....	
9,250	37,000	.001100	.000033	....	....	
9,500	38,000	.001133	.000033	....	....	
9,750	39,000	.001167	.000034	....	....	
10,000	40,000	.001233	.000066	0.	....	Elastic limit.
10,250	41,000	.005667	.004434	....	....	
10,500	42,000	.008933	.003266	....	....	
10,750	43,000	.008967	.000034	....	....	
11,000	44,000	.009000	.000033	....	....	
11,250	45,000	.009033	.000033	.007300	.007300	
11,500	46,000	.009300	.000267	....	....	
11,750	47,000	.009567	.000267	....	....	
12,000	48,000	.010233	.000666	....	....	
12,250	49,000	.010967	.000734	....	....	
12,500	50,000	.012233	.001266	.010333	.003033	
12,750	51,000	.012667	.000434	....	....	
13,000	52,000	.013667	.001000	....	....	
13,250	53,000	.014367	.000700	....	....	
13,500	54,000	.015433	.001066	....	....	
13,750	55,000	.016367	.000934	.014133	.003800	
14,000	56,000	.017767	.001400	....	....	
14,250	57,000	.018400	.000633	....	....	
14,500	58,000	.020100	.001700	....	....	
14,750	59,000	.021333	.001233	....	....	
15,000	60,000	.022600	.001267	....	....	
15,500	62,000	.024500	.001900	....	....	
16,000	64,000	.027000	.002500	....	....	
16,500	66,000	.030000	.003000	....	....	
17,000	68,000	.033000	.003000	....	....	
17,500	70,000	.037533	.004533	....	....	
18,000	72,000	.042000	.004467	....	....	
18,500	74,000	.045267	.003267	....	....	
19,000	76,000	.050667	.005400	....	....	
19,500	78,000	.057067	.006400	....	....	
20,000	80,000	.064667	.007600	....	....	Micrometer removed.
20,500	82,000	.0767	.012033	....	....	
21,000	84,000	.0967	.0200	....	....	
21,500	86,000	.1200	.0233	....	....	
21,680	86,720	.1733	.0533	....	....	Ultimate strength.
19,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds.. 86,720
Elastic limit per square inch of original section....................do.... 40,000
Elongation per inch after rupture....................inch.. 0.2400
Elongation per inch under strain at elastic limit....................do.... .001233
Reduction in diameter at point of rupture....................do.... .134
Reduction in area after rupture, per centum of original section.................... 41.9
Position of rupture....................1″.05 from neck
Character of broken surface, dull silky, 40 per centum; fine granular, 60 per centum. The bar parted first in the silky section.
Elongation of inch sections....................″.15, ″.24 (″.33 fractured section)

No. 397.

Tension Test.

Marks on bar, $^{\mathrm{R\,R_2}}_{\mathrm{M}}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000400	.000167	0.	....	
5,000	20,000	.000567	.000167	0.	....	
6,250	25,000	.000733	.000166	0.	....	
7,500	30,000	.000900	.000167	0.	....	
7,750	31,000	.000933	.000033	....	....	
8,000	32,000	.000967	.000034	....	....	
8,250	33,000	.001000	.000033	....	....	
8,500	34,000	.001033	.000033	....	....	
8,750	35,000	.001067	.000034	0.	....	
9,000	36,000	.001100	.000033	....	....	
9,250	37,000	.001133	.000033	....	....	
9,500	38,000	.001200	.000067	....	....	
9,750	39,000	.001283	.000033	....	....	
10,000	40,000	.001300 .005267	.000067 .003967	.... .003867	.... .003867	Elastic limit.
10,250	41,000	.005633	.000366	....	....	
10,500	42,000	.005967	.000334	....	....	
10,750	43,000	.006433	.000466	....	....	
11,000	44,000	.007267	.000834	....	....	
11,250	45,000	.008033	.000766	.006433	.002566	
11,500	46,000	.008900	.000867	....	....	
11,750	47,000	.009433	.000533	....	....	
12,000	48,000	.010400	.000967	....	....	
12,250	49,000	.011000	.000600	....	....	
12,500	50,000	.011900	.000900	.010000	.003567	
12,750	51,000	.012700	.000800	....	....	
13,000	52,000	.013433	.000733	....	....	
13,250	53,000	.014500	.001067	....	....	
13,500	54,000	.015600	.001100	....	....	
13,750	55,000	.016433	.000833	.011133	.001133	
14,000	56,000	.017600	.001167	....	....	
14,250	57,000	.018367	.000767	....	....	
14,500	58,000	.019500	.001133	....	....	
14,750	59,000	.020600	.001100	....	....	
15,000	60,000	.022100	.001500	.019600	....	
15,500	62,000	.024067	.001967	....	....	
16,000	64,000	.026767	.002700	....	....	
16,500	66,000	.029767	.003000	....	....	
17,000	68,000	.032967	.003200	....	....	
17,500	70,000	.036000	.003033	....	....	
18,000	72,000	.040000	.004000	....	....	
18,500	74,000	.044167	.004167	....	....	
19,000	76,000	.049333	.005166	....	....	
19,500	78,000	.056000	.006667	....	....	
20,000	80,000	.064000	.008000	....	....	Micrometer removed.
20,500	82,000	.0733	.0093	....	....	
21,000	84,000	.0867	.0134	....	....	
21,500	86,000	.1100	.0233	....	....	
21,750	87,000	.1700	.0600	....	....	Ultimate strength.
20,000	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8654
Hardness		15.35
Tensile strength per square inch of original section	pounds	87,000
Elastic limit per square inch of original section	do	40,000
Elongation per inch after rupture	inch	0.2333
Elongation per inch under strain at elastic limit	do	.001300
Reduction in diameter at point of rupture	do	.104
Reduction in area after rupture, per centum of original section		33.5
Position of rupture		1″.35 from neck
Character of broken surface		fine granular, radiating from a dull. silky spot at circumference
Elongation of inch sections		″.17 (″.32 fractured section), ″.21

No. 398.

Tension Test.

Marks on bar, $^{R\,R_s}_{\bullet\,M}$
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000200	.000133	0.	....	
3,750	15,000	.000333	.000133	0.	....	
5,000	20,000	.000467	.000134	0.	....	
6,250	25,000	.000667	.000200	0.	....	
7,500	30,000	.000800	.000133	0.	....	
7,750	31,000	.000867	.000067	....	....	
8,000	32,000	.000900	.000033	....	....	
8,250	33,000	.000933	.000033	....	....	
8,500	34,000	.000967	.000034	....	....	
8,750	35,000	.001000	.000033	0.	....	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001167	.000067	....	....	
10,000	40,000	.001200	.000033	0.	....	Elastic limit.
10,250	41,000	.004667	.003467	....	....	
10,500	42,000	.006000	.001333	....	....	
10,750	43,000	.006833	.000833	....	....	
11,000	44,000	.007100	.000267	.....	......	
11,250	45,000	.007767	.000667	.006000	.006000	
11,500	46,000	.008367	.000600	....	....	
11,750	47,000	.009267	.000900	....	....	
12,000	48,000	.010000	.000733	....	....	
12,250	49,000	.010733	.000733	....	....	
12,500	50,000	.011700	.000967	.009800	.003800	
12,750	51,000	.012333	.000633	....	....	
13,000	52,000	.013233	.000933	....	....	
13,250	53,000	.014000	.000767	....	....	
13,500	54,000	.015233	.001233	....	....	
13,750	55,000	.015933	.000700	.013733	.003933	
14,000	56,000	.017000	.001067	....	....	
14,250	57,000	.017733	.000733	....	....	
14,500	58,000	.019033	.001300	....	....	
14,750	59,000	.020200	.001167	....	....	
15,000	60,000	.021067	.001467	.019167	.005434	
15,500	62,000	.023867	.002200	....	....	
16,000	64,000	.026433	.002566	....	....	
10,500	66,000	.029033	.002600	....	....	
17,000	68,000	.032967	.003934	....	....	
17,500	70,000	.035667	.002700	....	....	
18,000	72,000	.039267	.003600	....	....	
18,500	74,000	.044133	.004866	....	....	
19,000	76,000	.049667	.005534	....	....	
19,500	78,000	.055333	.005666	....	....	
20,000	80,000	.062333	.007000	....	....	Micrometer removed.
20,500	82,000	.0767	.014367	....	....	
21,000	84,000	.0867	.0100	....	....	
21,500	86,000	.1133	.0266	....	....	
21,860	87,440	.1667	.0534	....	....	Ultimate strength.
19,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	87,440
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.2500
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.124
Reduction in area after rupture, per centum of original section		39.2
Position of rupture		″.25 from middle of stem
Character of broken surface		dull silky, 90 per centum; granular, 10 per centum; oblique fracture
Elongation of inch section		″.17 (″.37 fractured section), ″.21

No. 399.

Tension Test.

Marks on bar, $\frac{SS}{M}$
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000233	.000166	0.	....	
3,750	15,000	.000367	.000134	0.	....	
5,000	20,000	.000533	.000166	0.	....	
6,250	25,000	.000700	.000167	0.	....	
7,500	30,000	.000867	.000167	0.	....	
7,750	31,000	.000867	0.	....	....	
8,000	32,000	.000900	.000033	....	....	
8,250	33,000	.000933	.000033	....	....	
8,500	34,000	.000967	.000034	....	....	
8,750	35,000	.001000	.000033	0.	....	
9,000	36,000	.001033	.000033	....	....	
9,250	37,000	.001067	.000034	....	....	
9,500	38,000	.001100	.000033	....	....	
9,750	39,000	.001133	.000033	....	....	
10,000	40,000	.001167	.000034	0.	....	
10,250	41,000	.001200	.000033	....	....	
10,500	42,000	.001233	.000033	....	....	
10,750	43,000	.001267	.000034	....	....	
11,000	44,000	.001300	.000033	....	....	
11,250	45,000	.001333	.000033	0.	....	
11,500	46,000	.001367	.000034	....	....	
11,750	47,000	.001400	.000033	....	....	
12 000	48,000	.001433	.000033	....	....	
12,250	49,000	.001467	.000034	....	....	
12,500	50,000	.001500	.000033	.000033	.000033	
12,750	51,000	.001567	.000067	....	....	
13,000	52,000	.001633	.000066	....	....	
13,250	53,000	.001700	.000067	....	....	Elastic limit.
13,500	54,000	.004067	.002367	....	....	
13,750	55,000	.006400	.002333	.004567	.004534	
14,000	56,000	.007733	.001333	....	....	
14,250	57,000	.008600	.000867	....	....	
14,500	58,000	.009900	.001300	....	....	
14,750	59,000	.011067	.001167	....	....	
15,000	60,000	.012100	.001033	.009833	.005266	
15,500	62,000	.013600	.001500	....	....	
16,000	64,000	015000	.001400	....	....	
16,500	66,000	.017000	.002000	....	....	
17,000	68,000	.020000	.003000	....	....	
17,500	70,000	.022333	.002333	....	....	
18,000	72,000	.024667	.002334	....	....	
18,500	74,000	.027400	.002733	....	....	
19,000	76,000	.030600	.003200	....	....	
19,500	78,000	.034000	.003400	....	....	
20,000	80,000	.038000	.004000	....	....	
20,500	82,000	.043033	.005033	....	....	
21,000	84,000	.048000	.004967	....	....	Micrometer removed.
21,500	86,000	.0533	.0053	....	....	
22,000	88,000	.0667	.0134	....	....	
22,500	90,000	.0767	.0100	....	....	
23,000	92,000	.0967	.0200	....	....	
23,380	93,520	.1400	.0433	....	....	Ultimate strength.
19,900	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity		7.8614
Hardness		20.03
Tensile strength per square inch of original section	pounds	93,520
Elastic limit per square inch of original section	do	53,000
Elongation per inch after rupture	inch	0.2267
Elongation per square inch under strain at elastic limit	do	.001700
Reduction in diameter at point of rupture	do	.174
Reduction in area after rupture, per centum of original section		52.2
Position of rupture		1".40 from neck
Character of broken surface		fine silky; cup-shaped ends
Elongation of inch sections		".10 (".37 fractured section), ".21

No. 400.

Tension Test.

Marks on bar, $\frac{T_1}{M}$
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000325	.000175	.000025	.000025	
3,750	15,000	.000475	.000150	.000025	0.	
5,000	20,000	.000650	.000175	.000050	.000025	
6,250	25,000	.000825	.000175	.000075	.000025	
7,500	30,000	.000950	.000125	.000075	0.	
7,750	31,000	.001025	.000073	....	....	
8,000	32,000	.001050	.000025	....	....	
8,250	33,000	.001075	.000035	....	....	
8,500	34,000	.001125	.000050	....	....	
8,750	35,000	.001150	.000025	.000075	0.	
9,000	36,000	.001200	.000050	....	....	
9,250	37,000	.001225	.000025	....	....	
9,500	38,000	.001250	.000025	....	....	
9,750	39,000	.001275	.000025	....	....	
10,000	40,000	.001325	.000050	.000075	0.	
10,250	41,000	.001350	.000025	....	....	
10,500	42,000	.001375	.000025	....	....	
10,750	43,000	.001425	.000050	....	....	
11,000	44,000	.001450	.000025	....	....	
11,250	45,000	.001500	.000050	.000100	.000025	
11,500	46,000	.001550	.000050	....	....	
11,750	47,000	.001600	.000050	....	....	Elastic limit.
12,000	48,000	.001750	.000150	....	....	
12,250	49,000	.002000	.000250	....	....	
12,500	50,000	.002350	.000350	.000800	.000700	
12,750	51,000	.002725	.000375	....	....	
13,000	52,000	.003575	.000850	....	....	
13,250	53,000	.004650	.001075	....	....	
13,500	54,000	.008750	.004100	....	....	
13,750	55,000	.009450	.000700	.007450	.006650	
14,000	56,000	.010125	.000675	....	....	
14,250	57,000	.010725	.000600	....	....	
14,500	58,000	.011725	.001000	....	....	
14,750	59,000	.012300	.000575	....	....	
15,000	60,000	.013525	.001225	.011250	.003800	
15,500	62,000	.015300	.001775	....	....	
16,000	64,000	.017000	.001700	....	....	
16,500	66,000	.019375	.002375	....	....	
17,000	68,000	.022025	.002650	....	....	
17,500	70,000	.024300	.002275	....	....	
18,000	72,000	.027000	.002700	....	....	
18,500	74,000	.032025	.005025	....	....	
19,000	76,000	.033525	.001500	....	....	
19,500	78,000	.037500	.003975	....	....	
20,000	80,000	.044500	.007000	....	....	Micrometer removed.
20,500	82,000	.0500	.0055	....	....	
21,000	84,000	.0575	.0075	....	....	
21,500	86,000	.0650	.0075	....	....	
22,000	88,000	.0775	.0125	....	....	
22,500	90,000	.0950	.0175	....	....	
22,920	91,680	.1500	.0550	....	....	Ultimate strength.
18,200	....	....	....	....	....	Load at time of rupture.

General summary.

Specific gravity	7.8643
Hardness	21.05
Tensile strength per square inch of original section .... pounds..	91,680
Elastic limit per square inch of original section .... do....	47,000
Elongation per inch after rupture .... inch..	0.2225
Elongation per inch under strain at elastic limit .... do....	.001600
Reduction in diameter at point of rupture .... do....	.194
Reduction in area after rupture, per centum of original section	57.0
Position of rupture	1''.20 from neck
Character of broken surface	fine silky, cup-shaped ends
Elongation of inch sections	''.12, ''.15, ''.26 (''.36 fractured section)

No. 401.

Tension Test.

Marks on bar, $\frac{T_3}{M}$

Diameter, ".564.

Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000250	.000150	0.	....	
3,750	15,000	.000425	.000175	0.	....	
5,000	20,000	.000575	.000150	0.	....	
6,250	25,000	.000725	.000150	0.	....	
7,500	30,000	.000900	.000175	0.	....	
7,750	31,000	.000925	.000025	....	....	
8,000	32,000	.000950	.000025	....	....	
8,250	33,000	.000975	.000025	....	....	
8,500	34,000	.001000	.000025	....	....	
8,750	35,000	.001025	.000025	0.	....	
9,000	36,000	.001050	.000025	....	....	
9,250	37,000	.001075	.000025	....	....	
9,500	38,000	.001125	.000050	....	....	
9,750	39,000	.001150	.000025	....	....	
10,000	40,000	.001225	.000075	.000025	.000025	
10,250	41,000	.001250	.000025	....	....	
10,500	42,000	.001300	.000050	....	....	
10,750	43,000	.001325	.000025	....	....	
11,000	44,000	.001350	.000025	....	....	
11,250	45,000	.001400	.000050	.000025	0.	
11,500	46,000	.001425	.000025	....	....	
11,750	47,000	.001450	.000025	....	....	
12,000	48,000	.001500	.000050	....	....	
12,250	49,000	.001550	.000050	....	....	
12,500	50,000	.001575	.000025	.000050	.000025	
12,750	51,000	.001625	.000050	....	....	
13,000	52,000	.001675	.000050	....	....	
13,250	53,000	.001700	.000025	....	....	
13,500	54,000	.001775	.000075	....	....	
13,750	55,000	.001825	.000050	.000125	.000075	Elastic limit.
14,000	56,000	.009975	.008150	....	....	
14,250	57,000	.010700	.000725	....	....	
14,500	58,000	.011325	.000625	....	....	
14,750	59,000	.012200	.000875	....	....	
15,000	60,000	.013575	.001375	.011200	.011075	
15,500	62,000	.014825	.001250	....	....	
16,000	64,000	.016750	.001925	....	....	
16,500	66,000	.018600	.001850	....	....	
17,000	68,000	.021100	.002500	....	....	
17,500	70,000	.023750	.002650	....	....	
18,000	72,000	.026075	.002325	....	....	
18,500	74,000	.028800	.002725	....	....	
19,000	76,000	.032375	.003575	....	....	
19,500	78,000	.036075	.003700	....	....	
20,000	80,000	.040750	.004675	....	....	
20,500	82,000	.045500	.004750	....	....	
21,000	84,000	.052000	.006500	....	....	Micrometer removed.
21,500	86,000	.0625	.0105	....	....	
22,000	88,000	.0725	.0100	....	....	
22,500	90,000	.0900	.0175	....	....	
22,960	91,840	.1475	.0575	....	....	Ultimate strength.
18,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	91,840
Elastic limit per square inch of original section	do....	55,000
Elongation per inch after rupture	inch..	0.2400
Elongation per inch under strain at elastic limit	do....	.001825
Reduction in diameter at point of rupture	do....	.194
Reduction in area after rupture, per centum of original section		57.0
Position of rupture		1".20 from neck
Character of broken surface		fine silky, cup-shaped ends
Elongation of inch sections		".13, ".20, ".27 (".36 fractured section)

13.—STEEL FROM THE TUBE OF THE 8″ YATES B. L. RIFLE.

No. 563.

Mark, B
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000250	.000100	0.	....	
3,750	15,000	.000400	.000150	0.	....	
5,000	20,000	.000550	.000150	0.	....	
6,250	25,000	.000750	.000200	—.000050	—.000030	
7,500	30,000	.000950	.000200	—.000050	0.	
8,750	35,000	.001200	.000250	—.000050	0.	
10,000	40,000	.001500	.000300	0.	.000050	
10,250	41,000	.001550	.000050	....	....	Elastic limit.
10,500	42,000	.001700	.000150	....	....	
10,750	43,000	.002100	.000400	....	....	
11,000	44,000	.002950	.000850	....	....	
11,250	45,000	.003400	.000450	.001350	.001350	
11,500	46,000	.003950	.000550	....	....	
11,750	47,000	.004200	.000250	....	....	
12,000	48,000	.005050	.000850	....	....	
12,250	49,000	.005500	.000450	....	....	
12,500	50,000	.006650	.001150	.004350	.003000	
12,750	51,000	.006850	.000200	....	....	
13,000	52,000	.007400	.000550	....	....	
13,250	53,000	.008050	.000650	....	....	
13,500	54,000	.009050	.001000	....	....	
13,750	55,000	.009650	.000600	....	....	
14,000	56,000	.010550	.000900	....	....	
14,250	57,000	.011100	.000550	....	....	
14,500	58,000	.012000	.000900	....	....	
14,750	59,000	.012800	.000800	....	....	
15,000	60,000	.013700	.000900	....	....	
15,500	62,000	.015400	.001700	....	....	
16,000	64,000	.017350	.001950	....	....	
16,500	66,000	.019150	.001800	....	....	
17,000	68,000	.021400	.002250	....	....	
17,500	70,000	.023500	.002100	....	....	
18,000	72,000	.025750	.002250	....	....	
18,500	74,000	.028600	.002850	....	....	
19,000	76,000	.030750	.002150	....	....	
19,500	78,000	.033900	.003150	....	....	
20,000	80,000	.037000	.003100	....	....	
20,500	82,000	.040600	.003600	....	....	
21,000	84,000	.045000	.004400	....	....	
21,500	86,000	.049600	.004600	....	....	
21,900	87,600	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	87,600
Elastic limit per square inch of original section	do....	41,000
Elongation per inch after rupture	inch..	0.0500
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.004
Reduction in area after rupture, per centum of original section		1.5
Position of rupture		at neck

Character of broken surface, granular, radiating from a point in circumference of broken surface; fractured suddenly under the maximum load.

Elongation of inch sections .... ″.08 ″.07

No. 564.

Mark, C
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.		
2,500	10,000	.000300	.000150	0.		
3,750	15,000	.000500	.000200	0.		
5,000	20,000	.000650	.000150	0.		
6,250	25,000	.000850	.000200	0.		
7,500	30,000	.001100	.000250	0.		
8,750	35,000	.001300	.000200	.000050	.000050	
9,000	36,000	.001400	.000100			
9,250	37,000	.001400	0.			
9,500	38,000	.001450	.000050			
9,750	39,000	.001500	.000050			
10,000	40,000	.001550	.000050			Elastic limit.
10,250	41,000	.001750	.000200			
10,500	42,000	.002000	.000250			
10,750	43,000	.002450	.000450			
11,000	44,000	.003100	.000650			
11,250	45,000	.003450	.000350	.001500	.001450	
11,500	46,000	.003900	.000450			
11,750	47,000	.004400	.000500			
12,000	48,000	.004900	.000500			
12,250	49,000	.005600	.000700			
12,500	50,000	.006550	.000950	.004400	.002900	
12,750	51,000	.007100	.000550			
13,000	52,000	.007900	.000800			
13,250	53,000	.008600	.000700			
13,500	54,000	.009150	.000550			
13,750	55,000	.009650	.000500			
14,000	56,000	.010400	.000750			
14,250	57,000	.011600	.001200			
14,500	58,000	.012350	.000750			
14,750	59,000	.013150	.000800			
15,000	60,000	.014900	.001750			
15,500	62,000	.016150	.001250			
16,000	64,000	.017750	.001600			
16,500	66,000	.019450	.001700			
17,000	68,000	.021750	.002300			
17,500	70,000	.024850	.003100			
18,000	72,000	.0250	.000150			
18,500	74,000	.0300	.0050			
19,000	76,000	.0325	.0025			
19,500	78,000	.0350	.0025			
20,000	80,000	.0400	.0050			
20,500	82,000	.0425	.0025			
21,000	84,000	.0450	.0025			
21,500	86,000	.0500	.0050			
22,000	88,000	.0575	.0075			
22,180	88,720					Tensile strength.

General summary.

Specific gravity	7.8544
Hardness	17.90
Tensile strength per square inch of original section ... pounds..	88,720
Elastic limit per square inch of original section ... do....	40,000
Elongation per inch after rupture ... inch..	0.0700
Elongation per inch under strain at elastic limit ... do....	.001500
Reduction in diameter at point of rupture ... do....	.014
Reduction in area after rupture, per centum of original section	5.0
Position of rupture	".1 from middle of stem
Character of broken surface, granular, radiating from a point near the circumference of the fractured surface.	
Elongation of inch sections	".07, ".07

No. 565.

Mark, D
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000100	.000100	0.	....	
2, 500	10, 000	.000300	.000200	0.	....	
3, 750	15, 000	.000500	.000200	0.	....	
5, 000	20, 000	.000700	.000200	0.	....	
6, 250	25, 000	.001000	.000300	0.	....	
7, 500	30, 000	.001200	.000200	0.	....	
8, 750	35, 000	.001400	.000200	0.	....	
9, 000	36, 000	.001450	.000050	....	....	
9, 250	37, 000	.001450	0.	....	....	
9, 500	38, 000	.001500	.000050	....	....	
9, 750	39, 000	.001550	.000050	....	....	Elastic limit.
10, 000	40, 000	.001850	.000300	.000250	.000250	
10, 250	41, 000	.001950	.000100	....	....	
10, 500	42, 000	.002450	.000500	....	....	
10, 750	43, 000	.002750	.000300	....	....	
11, 000	44, 000	.003450	000700	....	....	
11, 250	45, 000	.003900	.000450	.001900	.001650	
11, 500	46, 000	.004450	.000550	....	....	
11, 750	47, 000	.004850	.000400	....	....	
12, 000	48, 000	.005600	.000750	....	....	
12, 250	49, 000	.006300	.000700	....	....	
12, 500	50, 000	.007400	.001100	.005150	.003250	
12, 750	51, 000	.007700	.000300	....	....	
13, 000	52, 000	.008200	.000500	....	....	
13, 250	53, 000	.008700	.000500	....	....	
13, 500	54, 000	.009250	.000550	....	....	
13, 750	55, 000	.010500	.001250	....	....	
14, 000	56, 000	.011450	.000950	....	....	
14, 250	57, 000	.012250	.000800	....	....	
14, 500	58, 000	.013200	.000950	....	....	
14, 750	59, 000	.013950	.000750	....	....	
15, 000	60, 000	.015000	.001050	....	....	
15, 500	62, 000	.016600	.001600	....	....	
16, 000	64, 000	.018450	.001850	....	....	
16, 500	66, 000	.020600	.002150	....	....	
17, 000	68, 000	.022550	.001950	....	....	
17, 500	70, 000	.024900	.002350	....	....	
18, 000	72, 000	.027550	.002650	....	....	
18, 500	74, 000	.030600	.003050	....	....	
19, 000	76, 000	.034250	.003650	....	....	
19, 500	78, 000	.037500	.003250	....	....	
20, 000	80, 000	.0400	.0025	....	....	
20, 500	82, 000	.0450	.0050	....	....	
21, 000	84, 000	.0500	.0050	....	....	
21, 500	86, 000	.0550	.0050	....	....	
22, 000	88, 000	.0650	.0100	....	....	
22, 500	90, 000	.0700	.0050	....	....	
23, 000	92, 000	.0900	.0200	....	....	
23, 500	94, 000	.1100	.0200	....	....	
23, 700	94, 800	.1550	.0450	....	....	Tensile strength.
21, 800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	94, 800
Elastic limit per square inch of original section	do....	39, 000
Elongation per inch after rupture	inch..	.02400
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.114
Reduction in area after rupture, per centum of original section		36.4
Position of rupture		".25 from middle of stem
Character of broken surface		granular at circumference, dull center
Elongation of inch sections		".18, ".30

No. 566.

Mark, E
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000150	.000150	0.	....	
2,500	10,000	.000300	.000150	0.	....	
3,750	15,000	.000450	.000150	0.	....	
5,000	20,000	.000600	.000150	0.	....	
6,250	25,000	.000900	.000300	0.	....	
7,500	30,000	.001100	.000200	0.	....	
8,750	35,000	.001350	.000250	0.	....	
9,000	36,000	.001400	.000050	....	....	
9,250	37,000	.001450	.000050	....	....	
9,500	38,000	.001500	.000050	....	....	
9,750	39,000	.001550	.000050	....	....	Elastic limit.
10,000	40,000	.001750	.000200	.000200	.000200	
10,250	41,000	.002000	.000250	....	....	
10,500	42,000	.002250	.000250	....	....	
10,750	43,000	.002950	.000700	....	....	
11,000	44,000	.003450	.000500	....	....	
11,250	45,000	.004250	.000800	.002200	.002000	
11,500	46,000	.004700	.000450	....	....	
11,750	47,000	.005200	.000500	....	....	
12,000	48,000	.006200	.001000	....	....	
12,250	49,000	.006900	.000700	....	....	
12,500	50,000	.007450	.000550	.005300	.003100	
12,750	51,000	.007950	.000500	....	....	
13,000	52,000	.008850	.000900	....	....	
13,250	53,000	.009450	.000600	....	....	
13,500	54,000	.010400	.000950	....	....	
13,750	55,000	.010850	.000450	....	....	
14,000	56,000	.011850	.001000	....	....	
14,250	57,000	.012450	.000600	....	....	
14,500	58,000	.013550	.001100	....	....	
14,750	59,000	.014400	.000850	....	....	
15,000	60,000	.015600	.001200	....	....	
15,500	62,000	.017200	.001600	....	....	
16,000	64,000	.019350	.002150	....	....	
16,500	66,000	.021900	.002550	....	....	
17,000	68,000	.023700	.001800	....	....	
17,500	70,000	.026750	.003050	....	....	
18,000	72,000	.029000	.002250	....	....	
18,500	74,000	.032000	.003000	....	....	
19,000	76,000	.035400	.003400	....	....	
19,500	78,000	.0400	.0046	....	....	
20,000	80,000	.0450	.0050	....	....	
20,500	82,000	.0500	.0050	....	....	
21,000	84,000	.0550	.0050	....	....	
21,500	86,000	.0600	.0050	....	....	
22,000	88,000	.0700	.0100	....	....	
22,500	90,000	.0800	.0100	....	....	
23,000	92,000	.1050	.0250	....	....	
23,390	93,560	.1400	.0350	....	....	Tensile strength.
20,800	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	93,560
Elastic limit per square inch of original section	do....	39,000
Elongation per inch after rupture	inch..	0.2350
Elongation per inch under strain at elastic limit	do....	.001550
Reduction in diameter at point of rupture	do....	.184
Reduction in area after rupture, per centum of original section		41.9
Position of rupture		″.50 from middle
Character of broken surface		granular, with dull spongy center
Elongation of inch sections		″.35*, ″.12

No. 441.

Compression Tests.

Mark on bar, A
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.
Ultimate strength, 44,620 pounds=89,240 pounds per square inch.
Failed by triple flexure.
Bent 40° when fracture occurred.
Appearance granular.

No. 442.

Mark on bar, F
Length, 5″.
Diameter, ″.798.
Sectional area, .50 square inch.
Ultimate strength, 43,850 pounds=87,700 pounds per square inch.
Failed by triple flexure.
Bent 180° and ends closed down without fracture.

14.—SAMPLES OF STEEL WIRE USED IN THE CONSTRUCTION OF WIRE-WOUND GUNS.

This wire was made from billets 2″ square and weighing about 80 pounds each, made by the Otis Iron and Steel Company, Cleveland, Ohio.

Tensile tests of the metal, made at the steel works, are found in the Chief of Ordnance Report 1884.

These billets were taken by the Trenton Iron Company, Trenton, N. J., and first rolled into bars ½″ square and annealed; after which they were drawn without further annealing into the wire ″.15 square, and finally tinned to prepare it for soldering, when wound on the gun.

The elongations in tests Nos. 673 to 682, inclusive, were measured in a gauged length of 10″.

This wire does not show a sharply defined elastic limit, owing perhaps to its being curved before testing in a coil about 24″ diameter.

No. 594.

Samples of tinned-steel wire.

Sample .
Sectional area, ″.149×″.151=.0225 square inch.
Tensile strength, 4,080 pounds=181,330 pounds per square inch.
Broke at defective spot at corner of wire.
Second fracture:
Tensile strength, 4,390 pounds=195,110 pounds per square inch; fine granular appearance.

No. 595.

Sample . .
Sectional area, ″.150×″.147=.0221 square inch.
Tensile strength, 3,760 pounds=170,140 pounds per square inch; fine granular appearance.

No. 596.

Sample . . .
Sectional area, ″.151×″.151=.0228 square inch.
Tensile strength, 4,050 pounds=177,630 pounds per square inch; fine granular appearance.

Tinned-steel wire.

No. of test.	Marks.	Description.	Sectional area.
			Inch. *Sq. in.*
642	1	Tinned after 10th draught	.151 x .149 = .0225
643	11	Tinned after 9th draught, then drawn once.	.151 x .151 = .0228
644	111	Tinned after 8th draught, then drawn twice.	.150 x .148 = .0222

No. of test.	Marks.	Ultimate strength.		Area at fracture.	Contraction of area.	Appearance of fracture.
		Total.	Per square inch.			
		Pounds.	*Pounds.*	*Inch.* *Sq. inch.*	*Per cent.*	
642	1	4, 090	181, 780	.146 x .141 = .0206	8. 4	Fine silky.
643	11	3, 890	170, 610	.141 x .135 = .0190	16. 7	Fine silky.
644	111	3, 560	160, 360	.141 x .130 = .0183	17. 6	Fine silky.

No. 673.

Samples of tinned-steel wire.

Samples from 1 to 10 inclusive cut from the same piece of wire in the order they are numbered.

Mark, 1

Sectional area, ".147 × ".147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5, 000	0.	0.	0.	0.	Initial load.
216	10, 000	.000180	.000180	....	....	
324	15, 000	.000370	.000190	....	....	
432	20, 000	.000560	.000190	.000010	.000010	
540	25, 000	.000760	.000200	....	....	
648	30, 000	.000980	.000220	....	....	
756	35, 000	.001160	.000180	....	....	
864	40, 000	.001370	.000210	.000090	.000080	
972	45, 000	.001580	.000210	....	....	
1, 080	50, 000	.001700	.000180	....	....	
1, 188	55, 000	.001970	.000210	....	....	
1, 296	60, 000	.002170	.000200	.000180	.000090	
1, 404	65, 000	.002410	.000260	....	....	
1, 512	70, 000	.002640	.000210	....	....	
1, 620	75, 000	.002890	.000250	....	....	
1, 728	80, 000	.003120	.000230	.000380	.000200	
1, 836	85, 000	.003390	.000270	....	....	
1, 944	90, 000	.003630	.000240	....	....	
2, 052	95, 000	.003890	.000260	....	....	
2, 160	100, 000	.004160	.000270	.000670	.000290	
2, 268	105, 000	.004510	.000350	....	....	
2, 376	110, 000	.004780	.000270	....	....	
2, 484	115, 000	.005080	.000300	....	....	
2, 592	120, 000	.005400	.000320	.001090	.000420	
2, 700	125, 000	.005810	.000410	....	....	
2, 808	130, 000	.006150	.000340	....	....	
2, 916	135, 000	.006610	.000460	....	....	
3, 024	140, 000	.007150	.000540	.002010	.000920	
3, 132	145, 000	.007800	.000650	....	....	
3, 240	150, 000	.008500	.000700	....	....	
3, 848	178, 150	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	178, 150
Elastic limit per square inch of original section	not well defined.
Elongation per inch after rupture .... inch.	0. 0210
Dimensions at point of rupture	".135 × ".135
Reduction in area after rupture, per centum of original section	15. 7
Position of rupture	1. "5 inside gauged section
Character of broken surface	fine silky

No. 674.

Mark, 2
Sectional area, ″.147 × ″.147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	**Initial load.**
216	10,000	.000180	.000180	....	....	
324	15,000	.000370	.000190	....	....	
432	20,000	.000580	.000210	.000040	.000040	
540	25,000	.000780	.000200	....	....	
648	30,000	.000960	.000180	....	....	
756	35,000	.001150	.000190	....	....	
864	40,000	.001370	.000220	.000090	.000050	
972	45,000	.001560	.000190	....	....	
1,080	50,000	.001700	.000200	....	....	
1,188	55,000	.001960	.000200	....	....	
1,296	60,000	.002200	.000240	.000160	.000070	
1,404	65,000	.002410	.000210	....	....	
1,512	70,000	.002620	.000210	....	....	
1,620	75,000	.002850	.000230	....	....	
1,728	80,000	.003100	.000250	.000350	.000190	
1,836	85,100	.003320	.000220	....	....	
1,944	90,000	.003590	.000270	....	....	
2,052	95,000	.003820	.000230	....	....	
2,160	100,000	.004100	.000280	.000600	.000250	
2,268	105,000	.004400	.000300	....	....	
2,376	110,000	.004710	.000310	....	....	
2,484	115,000	.005030	.000320	....	....	
2,592	120,000	.005360	.000330	.001060	.000460	
2,700	125,000	.005310	....	....	....	
2,808	130,000	.006100	.000740	....	....	
2,916	135,000	.006600	.000500	....	....	
3,024	140,000	.007090	.000490	.001920	.000860	
3,132	145,000	.007700	.000610	....	....	
3,240	150,000	.008430	.000730	....	....	
3,348	155,000	.0095	.001070	....	....	
3,456	160,000	.0105	.0010	....	....	
3,564	165,000	.0115	.0010	....	....	
3,672	170,000	.0140	.0025	....	....	
3,780	175,000	.0170	.0030	....	....	
3,852	178,330	....	....	....	....	**Tensile strength.**

General summary.

Tensile strength per square inch of original section .... pounds..	178,330
Elastic limit, per square inch of original section	not well defined
Elongation per inch after rupture .... inch..	0.0260
Dimensions at point of rupture	″.135 × ″.135
Reduction in area after rupture, per centum of original section	15.7
Position of rupture	at middle
Character of broken surface	fine, silky

No. 675.

Mark, 3
Sectional area, ".147 × ".147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000200	.000200	....	....	
324	15,000	.000370	.000170	....	....	
432	20,000	.000580	.000210	0.	....	
540	25,000	.000780	.000200	....	....	
648	30,000	.000980	.000200	....	....	
756	35,000	.001180	.000200	....	....	
864	40,000	.001410	.000230	.000070	.000070	
972	45,000	.001610	.000200	....	....	
1,080	50,000	.001810	.000200	....	....	
1,188	55,000	.002010	.000200	....	....	
1,296	60,000	.002210	.000200	.000170	.000100	
1,404	65,000	.002440	.000230	....	....	
1,512	70,000	.002690	.000250	....	....	
1,620	75,000	.002900	.000210	....	....	
1,728	80,000	.003140	.000240	.000320	.000150	
1,836	85,000	.003390	.000250	....	....	
1,944	90,000	.003630	.000240	....	....	
2,052	95,000	.003890	.000260	....	....	
2,160	100,000	.004190	.000300	.000630	.000310	
2,268	105,000	.004520	.000330	....	....	
2,376	110,000	.004790	.000270	....	....	
2,484	115,000	.005130	.000340	....	....	
2,592	120,000	.005530	.000400	.001170	.000540	
2,700	125,000	.005840	.000310	....	....	
2,808	130,000	.006250	.000410	....	....	
2,916	135,000	.006710	.000460	....	....	
3,024	140,000	.007250	.000540	.002000	.000830	
3,132	145,000	.007890	.000640	....	....	
3,240	150,000	.008590	.000700	....	....	
3,348	155,000	.0090	.000410	....	....	
3,456	160,000	.0120	.0030	....	....	
3,564	165,000	.0140	.0020	....	....	
3,672	170,000	.0170	.0030	....	....	
3,780	175,000	.0200	.0030	....	....	
3,846	178,060	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	178,060
Elastic limit per square inch of original section		not well defined
Elongation per inch after rupture	inch..	0.0200
Dimensions at point of rupture		".135 × ".135
Reduction in area after rupture, per centum of original section		15.7
Position of rupture		2".40 outside gauged section
Character of broken surface		fine, silky

No. 676.

Mark, 4
Sectional area, ".147 × ".147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000200	.000200	....	....	
324	15,000	.000380	.000180	....	....	
432	20,000	.000570	.000190	0.	....	
540	25,000	.000740	.000170	....	....	
648	30,000	.000940	.000200	....	....	
756	35,000	.001140	.000200	....	....	
864	40,000	.001340	.000200	.000020	.000020	
972	45,000	.001540	.000200	....	....	
1,080	50,000	.001750	.000210	....	....	
1,188	55,000	.001940	.000190	....	....	
1,296	60,000	.002180	.000240	.000080	.000060	
1,404	65,000	.002380	.000200	....	....	
1,512	70,000	.002590	.000210	....	....	
1,620	75,000	.002830	.000240	....	....	
1,728	80,000	.003080	.000250	.000270	.000190	
1,836	85,000	.003290	.000210	....	....	
1,944	90,000	.003530	.000240	....	....	
2,052	95,000	.003790	.000260	....	....	
2,160	100,000	.004080	.000290	.000520	.000250	
2,268	105,000	.004420	.000340	....	....	
2,376	110,000	.004680	.000260	....	....	
2,484	115,000	.005040	.000360	....	....	
2,592	120,000	.005390	.000350	.001070	.000550	
2,700	125,000	.005790	.000400	....	....	
2,808	130,000	.006110	.000320	....	....	
2,916	135,000	.006590	.000480	....	....	
3,024	140,000	.007090	.000500	.001880	.000810	
3,132	145,000	.007750	.000660	....	....	
3,240	150,000	.008450	.000700	....	....	
3,348	155,000	.0090	.000550	....	....	
3,456	160,000	.0100	.0010	....	....	
3,564	165,000	.0120	.0020	....	....	
3,672	170,000	.0140	.0020	....	....	
3,780	175,000	.0180	.0040	....	....	
3,844	177,960	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	177,960
Elastic limit per square inch of original section	not well defined.
Elongation per inch after rupture ....inch..	0.0200
Dimensions at point of rupture	".133 × ".133
Reduction in area after rupture, per centum of original section	18.1
Position of rupture	1".50 from middle
Character of broken surface	fine, silky

No. 677.

Mark, 5

Sectional area, ".147 × ".147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000190	.000190	....	....	
324	15,000	.000380	.000190	....	....	
432	20,000	.000580	.000200	0.	....	
540	25,000	.000760	.000180	....	....	
648	30,000	.000930	.000170	....	....	
756	35,000	.001120	.000190	....	....	
864	40,000	.001320	.000200	.000010	.000010	
972	45,000	.001520	.000200	....	....	
1,080	50,000	.001710	.000190	....	....	
1,188	55,000	.001910	.000200	....	....	
1,296	60,000	.002120	.000210	.000080	.000070	
1,404	65,000	.002330	.000210	....	....	
1,512	70,000	.002550	.000220	....	....	
1,620	75,000	.002780	.000230	....	....	
1,728	80,000	.003000	.000220	.000200	.000120	
1,836	85,000	.003220	.000220	....	....	
1,944	90,000	.003470	.000250	....	....	
2,052	95,000	.003700	.000230	....	....	
2,160	100,000	.003970	.000270	.000480	.000280	
2,268	105,000	.004260	.000290	....	....	
2,376	110,000	.004510	.000250	....	....	
2,484	115,000	.004820	.000310	....	....	
2,592	120,000	.005150	.000330	.000810	.000330	
2,700	125,000	.005510	.000360	....	....	
2,808	130,000	.005830	.000320	....	....	
2,916	135,000	.006230	.000400	....	....	
3,024	140,000	.006840	.000610	.001540	.000730	
3,132	145,000	.007300	.000460	....	....	
3,240	150,000	.007970	.000670	....	....	
3,348	155,000	.0085	.000580	....	....	
3,456	160,000	.0005	.0010	....	....	
3,564	165,000	.0110	.0015	....	....	
3,672	170,000	.0130	.0020	....	....	
3,780	175,000	.0160	.0030	....	....	
3,850	178,240	.0290	.0130	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds.. 178,240
Elastic limit per square inch of original section .... not well defined.
Elongation per inch after rupture .... inch . 0.0290
Dimensions at point of rupture .... ".135 × ".135
Reduction in area after rupture, per centum of original section 15.7
Position of rupture .... at center-punch mark at end of gauged section
Character of broken surface .... fine, silky

No. 678.

Mark, 6
Sectional area, ''.147 × ''.147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000280	.000280	.000040	.000040	
324	15,000	.000510	.000230	.000040	0.	
432	20,000	.000690	.000180	.000050	.000010	
540	25,000	.000870	.000180	....	....	
648	30,000	.001040	.000170	....	....	
756	35,000	.001260	.000220	....	....	
864	40,000	.001460	.000200	.000110	.000060	
972	45,000	.001620	.000160	....	....	
1,080	50,000	.001830	.000210	....	....	
1,188	55,000	.002030	.000200	....	....	
1,296	60,000	.002250	.000220	.000190	.000080	
1,404	65,000	.002480	.000230	....	....	
1,512	70,000	.002680	.000200	....	....	
1,620	75,000	.002900	.000220	....	....	
1,728	80,000	.003140	.000240	.000370	.000180	
1,836	85,000	.003370	.000230	....	....	
1,944	90,000	.003610	.000240	....	....	
2,052	95,000	.003870	.000260	....	....	
2,160	100,000	.004120	.000250	.000610	.000250	
2,268	105,000	.004410	.000290	....	....	
2,376	110,000	.004660	.000250	....	....	
2,484	115,000	.004970	.000310	....	....	
2,592	120,000	.005250	.000280	.000940	.000330	
2,700	125,000	.005600	.000350	....	....	
2,808	130,000	.005930	.000330	....	....	
2,916	135,000	.006360	.000430	....	....	
3,024	140,000	.006850	.000490	.001670	.000730	
3,132	145,000	.007490	.000640	....	....	
3,240	150,000	.008080	.000590	....	....	
3,348	155,000	.0085	.000420	....	....	
3,456	160,000	.0095	.0010	....	....	
3,564	165,000	.0110	.0015	....	....	
3,672	170,000	.0130	.0020	....	....	
3,780	175,000	.0170	.0040	....	....	
3,840	177,780	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.................pounds..	177,780
Elastic limit per square inch of original section..................	not well defined
Elongation per inch after rupture.................inch..	0.0140
Dimensions at point of rupture.................	''.130 × ''.130
Reduction in area after rupture, per centum of original section.................	21.8
Position of rupture.................	outside gauged section 2''.75 from end of wire
Character of broken surface.................	fine silky; cup-shaped end

No. 679.

Mark, 7
Sectional area, ″.147×″.147=.0216 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000180	.000180	....	....	
324	15,000	.000360	.000180	....	....	
432	20,000	.000530	.000170	.000020	.000020	
540	25,000	.000720	.000190	....	....	
648	30,000	.000890	.000170	....	....	
756	35,000	.001090	.000200	....	....	
864	40,000	.001280	.000190	.000060	.000040	
972	45,000	.001460	.000180	....	....	
1,080	50,000	.001640	.000180	....	....	
1,188	55,000	.001840	.000200	....	....	
1,296	60,000	.002040	.000200	.000090	.000030	
1,404	65,000	.002310	.000270	....	....	
1,512	70,000	.002480	.000170	....	....	
1,620	75,000	.002710	.000230	....	....	
1,728	80,000	.002970	.000260	.000250	.000160	
1,856	85,000	.003210	.000240	....	....	
1,944	90,000	.003460	.000250	....	....	
2,052	95,000	.003700	.000240	....	....	
2,160	100,000	.003980	.000280	.000490	.000240	
2,268	105,000	.004270	.000290	....	....	
2,376	110,000	.004580	.000310	....	....	
2,484	115,000	.004880	.000300	....	....	
2,592	120,000	.005210	.000330	.000890	.000400	
2,700	125,000	.005610	.000400	....	....	
2,808	130,000	.005960	.000350	....	....	
2,916	135,000	.006360	.000400	....	....	
3,024	140,000	.006890	.000530	.001700	.000810	
3,132	145,000	.007560	.000670	....	....	
3,240	150,000	.008300	.000740	....	....	
3,348	155,000	.0095	.0012	....	....	
3,456	160,000	.0105	.0010	....	....	
3,564	165,000	.0130	.0025	....	....	
3,672	170,000	.0150	.0020	....	....	
3,780	175,000	.0200	.0050	....	....	
3,820	176,850	.0230	.0030	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section......pounds..	176,850
Elastic limit per square inch of original section......	not well defined.
Elongation after rupture......inch..	0.0160
Dimensions at point of rupture......	″.140 × ″.140
Reduction in area after rupture, per centum of original section......	9.2
Position of rupture......	at center punch mark at end of gauged section
Character of broken surface......	fine silky, with fine radial seams

No. 680.

Mark, 8
Sectional area, ″.147 × ″.147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000210	.000210	....	....	
324	15,000	.000410	.000200	....	....	
432	20,000	.000600	.000190	0.	....	
540	25,000	.000760	.000160	....	....	
648	30,000	.000940	.000180	....	....	
756	35,000	.001140	.000200	....	....	
864	40,000	.001330	.000190	.000020	.000020	
972	45,000	.001510	.000180	....	....	
1,080	50,000	.001740	.000230	....	....	
1,188	55,000	.001910	.000170	....	....	
1,296	60,000	.002150	.000240	.000090	.000070	
1,404	65,000	.002340	.000190	....	....	
1,512	70,000	.002540	.000200	....	....	
1,620	75,000	.002810	.000270	....	....	
1,728	80,000	.003030	.000220	.000270	.000180	
1,836	85,000	.003250	.000220	....	....	
1,944	90,000	.003530	.000280	....	....	
2,052	95,000	.003740	.000210	....	....	
2,160	100,000	.004040	.000300	.000520	000250	
2,268	105,000	.004310	.000270	....	....	
2,376	110,000	.004640	.000330	....	....	
2,484	115,000	.004910	.000270	....	....	
2,592	120,000	.005290	.000380	.000900	.000380	
2,700	125,000	.005650	.000360	....	....	
2,808	130,000	.006020	.000370	....	....	
2,916	135,000	.006460	.000440	....	....	
3,024	140,000	.007020	.000560	.001730	.000830	
3,132	145,000	.007640	.000620	....	....	
3,240	150,000	.008310	.000670	....	....	
3,348	155,000	.0090	.000690	....	....	
3,456	160,000	.0100	.0010	....	....	
3,564	165,000	.0120	.0020	....	....	
3,672	170,000	.0160	.0040	....	....	
3,780	175,000	.0200	.0040	....	....	
3,820	176,940	.0300	.0100	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section .... pounds..	176,940
Elastic limit per square inch of original section	not well defined
Elongation per inch after rupture .... inch..	0.0240
Reduction in area after rupture, per centum of original section	19.9
Position of rupture	1″.4 from middle
Character of broken surface	fine silky

No. 681.

Mark, 9
Sectional area, ".147 × ".147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5,000	0.	0.	0.	0.	Initial load.
216	10,000	.000160	.000160	....	....	
324	15,000	.000340	.000180	....	....	
432	20,000	.000520	.000180	0.	....	
540	25,000	.000690	.000170	....	....	
648	30,000	.000880	.000190	....	....	
756	35,000	.001080	.000200	....	....	
864	40,000	.001270	.000190	0.	....	
972	45,000	.001480	.000210	....	....	
1,080	50,000	.001680	.000200	....	....	
1,188	55,000	.001880	.000200	....	....	
1,296	60,000	.002130	.000250	.000050	.000050	
1,404	65,000	.002350	.000220	....	....	
1,512	70,000	.002560	.000210	....	....	
1,620	75,000	.002810	.000250	....	....	
1,728	80,000	.003050	.000240	.000200	.000150	
1,836	85,000	.003200	.000250	....	....	
1,944	90,000	.003540	.000240	....	....	
2,052	95,000	.003800	.000260	....	....	
2,160	100,000	.004070	.000270	.000450	.000250	
2,268	105,000	.004370	.000300	....	....	
2,376	110,000	.004670	.000300	....	....	
2,484	115,000	.004980	.000310	....	....	
2,592	120,000	.005330	.000350	.000830	.000380	
2,700	125,000	.005740	.000410	....	....	
2,808	130,000	.006120	.000380	....	....	
2,916	135,000	.006590	.000470	....	....	
3,024	140,000	.007210	.000620	.001760	.000930	
3,132	145,000	.007900	.000690	....	....	
3,240	150,000	.008810	.000910	.002850	.001090	
3,348	155,000	.0100	.001190	....	....	
3,456	160,000	.0120	.0020	....	....	
3,564	165,000	.0140	.0020	....	....	
3,672	170,000	.0180	.0040	....	....	
3,739	173,100	.0290	.0110	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	173,100
Elastic limit per square inch of original section....	not well defined
Elongation per inch after rupture....inch..	0.0230
Dimensions at point of rupture	".133 × ".133
Reduction in area after rupture, per centum of original section....	18.1
Position of rupture	2" inside gauged section
Character of broken surface	fine silky

No. 682.

Mark, 10
Sectional area, ″.147 × ″.147 = .0216 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	R
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
108	5, 000	0.	0.	0.	0.	Initial lo
216	10, 000	.000260	.000260	−.000020	−.000020	
324	15, 000	.000430	.000170	....	....	
432	20, 000	.000650	.000220	−.000020	0.	
540	25, 000	.000820	.000170	....	....	
648	30, 000	.001060	.000240	....	....	
756	35, 000	.001200	.000140	....	....	
864	40, 000	.001420	.000220	−.000010	.000010	
972	45, 000	.001620	.000200	....	....	
1, 080	50, 000	.001820	.000200	....	....	
1, 188	55, 000	.002020	.000200	....	....	
1, 296	60, 000	.002260	.000240	.000070	.000080	
1, 404	65, 000	.002480	.000220	....	....	
1, 512	70, 000	.002680	.000200	....	....	
1, 620	75, 000	.002940	.000260	....	....	
1, 728	80, 000	.003180	.000240	.000250	.000180	
1, 836	85, 000	.003450	.000270	....	....	
1, 944	90, 000	.003730	.000280	....	....	
2, 052	95, 000	.004020	.000290	....	....	
2, 160	100, 000	.004320	.000300	.000610	.000360	
2, 268	105, 000	.004680	.000360	....	....	
2, 376	110, 000	.005020	.000340	....	....	
2, 484	115, 000	.005400	.000380	....	....	
2, 592	120, 000	.005780	.000380	.001180	.000570	
2, 700	125, 000	.006200	.000480	....	....	
2, 808	130, 000	.006700	.000440	....	....	
2, 916	135, 000	.007290	.000590	....	....	
3, 024	140, 000	.007940	.000650	.002410	.001230	
3, 132	145, 000	.008820	.000880	....	....	
3, 240	150, 000	.009800	.000980	....	....	
3, 348	155, 000	.0120	.0022	....	....	
3, 456	160, 000	.0150	.0030	....	....	
3, 564	165, 000	.0170	.0020	....	....	
3, 672	170, 000	.0200	.0030	....	....	
3, 710	171, 760	.0250	.0050	....	....	Tensile s

General summary.

Tensile strength per square inch of original section ....
Elastic limit per square inch of original section..
Elongation per inch after rupture ....
Dimensions at point of rupture..
Reduction in area after rupture, per centum of original section........................
Position of rupture ....at center punch mark at end
Character of broken surface..fine silky, witl

15.—STUBS, WIRE, NOT COILED.

No. 746.

Diameter, ."0792
Sectional area, .004926 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24.6	5,000	0.	0.	0.	0.	Initial load.
49.3	10,000	.000310	.000310	....	....	
98.5	20,000	.000710	.000400	....	....	
147.8	30,000	.001070	.000360	....	....	
197.0	40,000	.001520	.000450	....	....	
246.3	50,000	.001940	.000420	....	....	Elastic limit, approximate.
295.6	60,000	.002410	.000470	....	....	
344.8	70,000	.002950	.000540	....	....	
394.1	80,000	.003610	.000660	....	....	
443.3	90,000	.004340	.000730	....	....	
492.6	100,000	.005420	.001080	.001570	.001570	
654.0	132,760	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	132,760
Elastic limit per square inch of original section (approximate)	do	50,000
Elongation per inch after rupture	inch...	0.0170
Elongation per inch under strain at elastic limit	do....	.001940
Reduction in diameter at point of rupture	do....	.0152
Reduction in area after rupture, per centum of original section		34.7
Position of rupture		7" outside the gauged length
Character of broken surface		fine silky

No. 747.

Diameter, ″.039.
Sectional area, .001194 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
35.8	30,000	0.	0.	0.	0.	Initial load.
47.8	40,000	.000390	.000390	....	....	
59.7	50,000	.000700	.000310	....	....	
71.6	60,000	.000990	.000290	....	....	
83.6	70,000	.001300	.000310	....	....	
95.5	80,000	.001610	.000310	....	....	
107.5	90,000	.002000	.000390	....	....	
119.4	100,000	.002290	.000290	....	....	
131.3	110,000	.002570	.000280	....	....	
143.3	120,000	.002890	.000320	....	....	
155.2	130,000	.003310	.000420	....	....	
167.2	140,000	.003720	.000410	....	....	
179.1	150,000	.004180	.000460	....	....	
191.0	160,000	.004870	.000690	....	....	
203.0	170,000	.005800	.000930	....	....	
233.0	195,140	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	195,140
Elastic limit per square inch of original section		not well defined
Elongation per inch after rupture	inch..	0.0070
Reduction in diameter at point of rupture	do....	.000390
Reduction in area after rupture, per centum of original section		32.7
Position of rupture		inside the gauged length
Character of broken surface		fine, silky

16.—FOREIGN STEEL WIRE USED IN THE CONSTRUCTION OF WIRE-WOUND GUNS.

STEEL WIRE USED IN THE SCHULTZ 19 *CM. AND LARGER GUNS.*

[Three specimens cut from the same piece of wire. Wire received for testing in a coil 15" diameter.]

No. 738.

Specimen No. 1.

Diameter, ".0792.
Sectional area, .004926 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24.6	5,000	0.	0.	0.	0.	Initial load.
49.8	10,000	.000290	.000290			
98.5	20,000	.000630	.000340			
147.8	30,000	.000940	.000310			
197.0	40,000	.001270	.000330			
246.3	50,000	.001600	.000330			
295.6	60,000	.001980	.000380			
344.8	70,000	.002300	.000320			
394.1	80,000	.002600	.000300			
443.3	90,000	.002960	.000360			
492.6	100,000	.003310	.000350	.000100	.000100	
541.9	110,000	.003660	.000350			
591.1	120,000	.003990	.000330			
640.4	130,000	.004330	.000340			
689.6	140,000	.004710	.000380			
738.9	150,000	.005100	.000390			
788.2	160,000	.005470	.000370			
837.4	170,000	.005810	.000340			
886.7	180,000	.006200	.000390			
935.9	190,000	.006630	.000430			
985.2	200,000	.006980	.000350	.000410	.000310	
1034.5	210,000	.007360	.000380			
1083.7	220,000	.007750	.000390			
1133.0	230,000	.008220	.000470			
1182.2	240,000	.008690	.000470			
1231.5	250,000	.009240	.000550	.000750	.000340	
1280.8	260,000	.009900	.000660			
1330.0	270,000	.010490	.000590			
1612.0	327,240					Tensile strength.

General summary.

Tensile strength per square inch of original section ....pounds..	327,240
Elastic limit per square inch of original section	not well defined
Elongation per inch after rupture ....inch..	0.0060
Reduction in diameter at point of rupture ....do....	.000741
Reduction in area after rupture, per centum of original section	15.04
Position of rupture	5" outside the gauged length
Character of broken surface	fine silky

No. 737.

Specimen No. 2.

Diameter, ″.0792.
Sectional area, .004926 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24.6	5,000	0.	0.	0.	0.	Initial load.
49.3	10,000	.000190	.000190	....	....	
73.9	15,000	.000380	.000190	....	....	
98.5	20,000	.000530	.000150	....	....	
123.1	25,000	.000670	.000140	....	....	
147.8	30,000	.000840	.000170	....	....	
172.4	35,000	.001010	.000170	....	....	
197.0	40,000	.001180	.000170	....	....	
221.7	45,000	.001350	.000170	....	....	
246.3	50,000	.001510	.000160	....	....	
270.9	55,000	.001660	.000150	....	....	
295.6	60,000	.001820	.000160	....	....	
320.2	65,000	.002000	.000180	....	....	
344.8	70,000	.002160	.000160	....	....	
369.5	75,000	.002320	.000160	....	....	
394.1	80,000	.002490	.000170	....	....	
418.7	85,000	.002650	.000160	....	....	
443.3	90,000	.002840	.000190	....	....	
468.0	95,000	.003010	.000170	....	....	
492.6	100,000	.003180	.000170	.000090	.000090	
517.2	105,000	.003330	.000150	....	....	
541.9	110,000	.003500	.000170	....	....	
566.5	115,000	.003680	.000180	....	....	
591.1	120,000	.003860	.000180	....	....	
615.8	125,000	.004020	.000160	....	....	
640.4	130,000	.004190	.000170	....	....	
665.0	135,000	.004380	.000190	....	....	
689.6	140,000	.004560	.000180	....	....	
714.3	145,000	.004770	.000210	....	....	
738.8	150,000	.004920	.000150	....	....	
763.5	155,000	.005120	.000200	....	....	
788.2	160,000	.005310	.000190	....	....	
812.8	165,000	.005520	.000210	....	....	
837.4	170,000	.005700	.000180	....	....	
862.0	175,000	.005860	.000160	....	....	
886.7	180,000	.006060	.000200	....	....	
911.3	185,000	.006260	.000200	....	....	
935.9	190,000	.006440	.000180	....	....	
960.6	195,000	.006680	.000240	....	....	
985.2	200,000	.006860	.000180	....	....	
1,624.0	329,680	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section.....pounds..	329,680
Elastic limit per square inch of original section.....	not well defined
Elongation per inch after rupture.....inch..	0.0110
Reduction in diameter at point of rupture.....do....	.000854
Reduction in area after rupture, per centum of original section.....	17.34
Position of rupture.....	6″.5 outside the gauged length
Character of broken surface.....	fine silky

No. 739.

Specimen No. 3.

Diameter, ″.0792.
Sectional area, .004926 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
24.6	5,000	0.	0.	0.	0.	Initial load.
49.3	10,000	.000180	.000180	....	....	
98.5	20,000	.000530	.000350	....	....	
147.8	30,000	.000840	.000310	....	....	
197.0	40,000	.001180	.000340	....	....	
246.3	50,000	.001520	.000340	....	....	
295.6	60,000	.001840	.000320	....	....	
344.8	70,000	.002180	.000340	....	....	
394.1	80,000	.002530	.000350	....	....	
443.3	90,000	.002880	.000350	....	....	
492.6	100,000	.003190	.000310	.000160	.000160	
541.9	110,000	.003650	.000460	....	....	
551.1	120,000	.003940	.000290	....	....	
640.4	130,000	.004280	.000340	....	....	
689.6	140,000	.004640	.000360	....	....	
738.9	150,000	.005000	.000360	....	....	
788.2	160,000	.005340	.000340	....	....	
837.4	170,000	.005710	.000370	....	....	
886.7	180,000	.006080	.000370	....	....	
935.9	190,000	.006470	.000390	....	....	
985.2	200,000	.006860	.000390	.000420	.000260	
1,034.5	210,000	.007280	.000420	....	....	
1,083.7	220,000	.007640	.000360	....	....	
1,133.0	230,000	.008080	.000440	....	....	
1,182.2	240,000	.008550	.000470	....	....	
1,231.5	250,000	.009090	.000540	.000780	.000360	
1,280.8	260,000	.009670	.000580	....	....	
1,330.0	270,000	.010270	.000600	....	....	
1,379.3	280,000	.011000	.000730	....	....	
1,615	327,850	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section	pounds..	327,850
Elastic limit per square inch of original section		not well defined
Elongation per inch after rupture	inch..	0.0060
Reduction in diameter at point of rupture	do....	.000854
Reduction in area after rupture, per centum of original section		17.34
Position of rupture		4″ outside the gauged length

STEEL WIRE USED IN THE SCHULTZ 9 CM. GUNS.

[Three specimens cut from the same piece of wire. Wire received for testing, in a coil 7″ diameter.]

No. 740.

Specimen No. 1.

Diameter, ″.040.
Sectional area, .001257 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
25.1	20,000	0.	0.	0.	0.	**Initial load.**
37.7	30,000	.000510	.000510	....	....	
50.3	40,000	.000850	.000340	....	....	
62.9	50,000	.001220	.000370	....	....	
75.4	60,000	.001610	.000390	....	....	
88.0	70,000	.002030	.000420	....	....	
100.6	80,000	.002330	.000300	....	....	
113.1	90,000	.002720	.000390	....	....	
125.7	100,000	.003120	.000400	....	....	
138.3	110,000	.003410	.000290	....	....	
150.8	120,000	.003810	.000400	....	....	
163.4	130,000	.004220	.000410	....	....	
176.0	140,000	.004690	.000470	....	....	
188.6	150,000	.005210	.000520	....	....	
201.1	160,000	.005680	.000470	....	....	
213.7	170,000	.006160	.000480	....	....	
226.3	180,000	.006610	.000450	....	....	
238.8	190,000	.007070	.000460	....	....	
251.4	200,000	.007620	.000550	....	....	
264.0	210,000	.008220	.000600	....	....	
276.5	220,000	.008780	.000560	....	....	
289.1	230,000	.009410	.000630	....	....	
301.7	240,000	.010180	.000770	....	....	
314.3	250,000	.010920	.000740	....	....	
377.0	299,920	....	....	....	....	**Tensile strength.**

General summary.

Tensile strength per square inch of original section	pounds..	299,920
Elastic limit per square inch of original section		not well defined
Elongation per inch after rupture	inch..	0.0040
Reduction in diameter at point of rupture	do....	.000295
Reduction in area after rupture, per centum of original section		23.47
Position of rupture		8″ outside of the gauged length
Character of broken surface		fine silky

No. 741.

Specimen No. 2.

Diameter, ″.040.
Sectional area, .001257 square inch.

Applied loads.		Elongation per inch.	Successive Elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
25.1	20,000	0.	0.	0.	0.	Initial load.
37.7	30,000	.000380	.000380	....	....	
30.3	40,000	.000720	.000340	....	....	
62.9	50,000	.001080	.000360	....	....	
75.4	60,000	.001460	.000380	....	....	
88.0	70,000	.001800	.000340	....	....	
100.6	80,000	.002180	.000380	....	....	
113.1	90,000	.002540	.000360	....	....	
125.7	100,000	.002900	.000420	....	....	
138.3	110,000	.003370	.000410	....	....	
150.8	120,000	.003710	.000340	....	....	
163.4	130,000	.004120	.000410	....	....	
176.0	140,000	.004520	.000400	....	....	
188.6	150,000	.004950	.000430	....	....	
201.1	160,000	.005350	.000400	....	....	
213.7	170,000	.005790	.000440	....	....	
226.3	180,000	.006260	.000470	....	....	
238.8	190,000	.006750	.000490	....	....	
251.4	200,000	.007240	.000490	....	....	
264.0	210,000	.007720	.000480	....	....	
276.5	220,000	.008340	.000620	....	....	
289.1	230,000	.008960	.000620	....	....	
301.7	240,000	.009570	.000610	....	....	
314.3	250,000	.010260	.000690	....	....	
399.0	317,420	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section....pounds..	317,420
Elastic limit per square inch of original section....	not well defined
Elongation per inch after rupture....inch..	0.0060
Reduction in diameter at point of rupture....do....	.000240
Reduction in area after rupture, per centum of original section....	19.1
Position of rupture....	2″.25 outside the gauged length
Character of broken surface....	fine silky

No. 742.

Specimen No. 3.

Diameter, ".040.
Sectional area, .001257 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
25.1	20,000	0.	0.	0.	0.	Initial load.
37.7	30,000	.000370	.000370			
50.3	40,000	.000720	.000350			
62.9	50,000	.001120	.000400			
75.4	60,000	.001420	.000300			
88.0	70,000	.001820	.000400			
100.6	80,000	.002130	.000310			
113.1	90,000	.002510	.000380			
125.7	100,000	.002870	.000360			
138.3	110,000	.003250	.000380			
150.8	120,000	.003620	.000370			
163.4	130,000	.004040	.000420			
176.0	140,000	.004440	.000400			
188.6	150,000	.004940	.000500			
201.1	160,000	.005350	.000410			
213.7	170,000	.005810	.000460			
226.3	180,000	.006240	.000430			
238.8	190,000	.006740	.000500			
251.4	200,000	.007220	.000480			
264.0	210,000	.007710	.000490			
276.5	220,000	.008310	.000600			
289.1	230,000	.008900	.000590			
301.7	240,000	.009620	.000720			
314.3	250,000	.010350	.000730			
188.0	150,000	.008810				
393.0	312,650					Tensile strength.

General summary.

Tensile strength per square inch of original section........................pounds.. 312,650
Elastic limit per square inch of original section........................not well defined
Elongation per inch after rupture........................inch.. 0.0040
Reduction in diameter at point of rupture........................do.... .000295
Reduction in area after rupture, per centum of original section........................ 23.47
Position of rupture........................in holder jaws, 8" outside gauged length
Character of broken surface........................fine, silky

STEEL RIBBAND USED IN 9″ GUN BY THE ENGLISH GOVERNMENT AT WOOLWICH ARSENAL.

[Three specimens cut from the same piece of wire.]

When uncoiled the wire showed a permanent curve of ″.65 v-sine for a chord of 10″.

Cross-section dimensions were ″.254 total width by ″.0605 thickness = .0154 square inch. To allow for rounded corners, sectional area called .0147 square inch.

No. 743.

Specimen No. 1.

Sectional area, .0147 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
147	10, 000	0.	0.	0.	0.	Initial load.
294	20 000	.000370	.000370	....	....	
441	30, 000	.000710	.000340	....	....	
588	40, 000	.001040	.000330	....	....	
735	50, 000	.001400	.000360	.000070	.000070	
882	60, 000	.001750	.000350	....	....	
1, 029	70, 000	.002090	.000340	....	....	
1, 176	80, 000	.002470	.000380	....	....	
1, 323	90, 000	.002780	.000310	....	....	
1, 470	100, 000	.003250	.000470	.000230	.000160	
1, 617	110, 000	.003580	.000830	....	....	
1, 764	120, 000	.003990	.000410	....	....	
1, 911	130, 000	.004400	.000410	....	....	
2, 058	140, 000	.004720	.000320	....	....	
2, 205	150, 000	.005220	.000500	.000370	.000140	
2, 852	160, 000	.005670	.000450	....	....	
2, 499	170, 000	.006160	.000490	....	....	
2, 646	180, 000	.006660	.000500	....	....	
2, 793	190, 000	.007170	.000510	....	....	
2, 940	200, 000	.007770	.000600	.001140	.000770	
3, 087	210, 000	.008440	.000670	....	....	
3, 234	220, 000	.009220	.000780	....	....	
3, 881	230, 000	.010200	.000980	....	....	
3, 927	267, 140	....	....	....	....	Tensile strength.

General summary.

Tensile strength per square inch of original section......pounds..	267, 140
Elastic limit per square inch of original section......	not well defined
Elongation per inch after rupture......inch..	0. 0100
Dimensions at point of rupture......	″.235 × ″.055
Reduction in area after rupture, per centum of original section......	12. 24
Position of rupture......	″.8 inside the gauged length
Character of broken surface......	silky, lamellar

17.—CAST-STEEL TRIAL CYLINDER.

[Cast by the Otis Iron and Steel Company, Cleveland, Ohio.]

Extract from the Chief of Ordnance Report for 1884.

In conformity with instructions contained in a letter from the Chief of Ordnance, dated February 14, 1884, the Otis Iron and Steel Company made for test a trial cylinder of cast steel 24 inches in diameter and 5 feet long. It was made of open-hearth steel, from a heat of 31,000 pounds, and cast in a sand mold with a sinking head equal to the length of the cylinder. The mold was lined with thin sheet iron to preserve it from injury, the metal entering at the upper end of the mold cavity. The resulting ingot was 10 feet long, 25 inches in diameter, and weighed in the neighborhood of 17,000 pounds.

A mean of seven analyses made of borings taken from different parts of the cylinder was as follows: Combined carbon, 0.55 per cent.; silicon, 0.13 per cent.; phosphorus, 0.029 per cent.; manganese, 0.96 per cent.

The ingot was left in the pit to cool slowly for two days, and afterwards removed to the machine-shop, turned down to 24 inches, and the upper half cut off. A 6-inch hole was then bored through the center, when the cylinder was ready for annealing.

It was placed in a regenerative gas-heating furnace, with doors at both ends. A piece of iron pipe was inserted in the central hole at each end, and projected some inches beyond the doors, which were bricked up about the pipes. An inch steam pipe was conducted to one of these pipes, by means of which a jet of steam could be thrown in and a strong current of cold air produced through the bore of the cylinder. The temperature was raised gradually, the flame being directed alternately above and below the cylinder to insure even heating throughout. When at a yellow heat the gas was shut off and the cylinder allowed to cool in the furnace over night, the blast being left in action. This operation was repeated three times.

The cylinder was then removed to the lathe, and a ring 1.25 inches thick detached from each end, from which tangential and radial specimens were afterwards taken. Another ring, 2.5 inches thick, was cut from the lower end to be tested for initial tension. The remainder of the cylinder then received two through cuts lengthwise, removing two slabs, 3.25 inches thick, on opposite sides of the bore. From these slabs 16 specimen pieces were taken.

In all 28 specimens were taken from the cylinder, as follows:

Tension.—1 to 7 tangential, 1''.25 square, 9'' long. 7 to 11 radial, 1''.25 square, 9'' long. 11 to 17 longitudinal, 1''.25 square, 9'' long. 17 to 18 radial, 1''.25 square, 9'' long.

Compression.—19 to 20 radial, 1''.25 square, 9'' long. 21 to 22 longitudinal, 1''.25 square, 9'' long.

Transverse resistance.—23 and 24 longitudinal, 1''.25 square, 22'' long.

Bursting.—25 and 26 radial, 3''.25 square, 5'' long. 27 and 28 longitudinal, 3''.25 square, 5'' long.

Following are the results of the tests made at Watertown Arsenal:

No. 357.

Tension Test.

Mark on bar, 1.
Diameter, ".564.
Sectional area, .25 square inch.

This specimen had blow-holes in two places, about ".10 and ".08 diameters. One was in sight when bar was ".8 diameter, and one appeared when bar was turned down to finished diameter.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033	....	....	
750	3,000	.000083	.000050	....	....	
1,000	4,000	.000100	.000017	....	....	
1,250	5,000	.000117	.000017	0.	....	
1,500	6,000	.000133	.000016	....	....	
1,750	7,000	.000167	.000034	....	....	
2,000	8,000	.000200	.000033	....	....	
2,250	9,000	.000250	.000050	....	....	
2,500	10,000	.000300	.000050	0.	....	
2,750	11,000	.000300	0.	....	....	
3,000	12,000	.000317	.000017	....	....	
3,250	13,000	.000350	.000033	....	....	
3,500	14,000	.000400	.000050	....	....	
3,750	15,000	.000433	.000033	.000000	.000000	
4,000	16,000	.000483	.000050	....	....	
4,250	17,000	.000500	.000017	....	....	
4,500	18,000	.000533	.000017	....	....	
4,750	19,000	.000550	.000017	....	....	
5,000	20,000	.000600	.000050	.000017	.000017	
5,250	21,000	.000617	.000017	....	....	
5,500	22,000	.000650	.000033	....	....	
5,750	23,000	.000683	.000033	....	....	
6,000	24,000	.000717	.000034	....	....	
6,250	25,000	.000733	.000016	.000017	0.	
6,500	26,000	.000800	.000067	....	....	
6,750	27,000	.000833	.000033	....	....	
7,000	28,000	.000850	.000017	....	....	
7,250	29,000	.000867	.000017	....	....	
7,500	30,000	.000950	.000083	.000050	.000033	
7,750	31,000	.000950	0.	....	....	
8,000	32,000	.000983	.000033	....	....	
8,250	33,000	.001050	.000067	....	....	
8,500	34,000	.001083	.000033	....	....	
8,750	35,000	.001117	.000034	.000067	.000017	
9,000	36,000	.001150	.000033	....	....	
9,250	37,000	.001200	.000050	....	....	
9,500	38,000	.001233	.000033	....	....	
9,750	39,000	.001267	.000034	....	....	Elastic limit.
10,000	40,000	.001617 .002883	.000350 .001266	.... .001567	.... .001500	
10,250	41,000	.003783	.000900	....	....	
10,500	42,000	.005017	.001234	....	....	
10,750	43,000	.005567	.000550	....	....	
11,000	44,000	.006383	.000816	....	....	
11,250	45,000	.006950	.000567	.005367	.003800	
11,500	46,000	.007717	.000767	....	....	
11,750	47,000	.008133	.000416	....	....	
12,000	48,000	.009200	.001067	....	....	
12,250	49,000	.009750	.000550	....	....	
12,500	50,000	.010700	.000950	.008800	.003433	Micrometer removed.
13,000	52,000	.0133	.0026	....	....	
13,500	54,000	.0150	.0017	....	....	
14,000	56,000	.0167	.0017	....	....	
14,500	58,000	.0183	.0016	....	....	
15,000	60,000	.0200	.0017	....	....	
15,220	60,880	....	....	....	....	Ultimate strength.

Fractured suddenly under the maximum load.

General summary.

Tensile strength per square inch of original section........................pounds.. 60,880
Elastic limit per square inch of original section........................do.... 39,000
Elongation per inch after rupture........................inch.. 0.0200
Elongation per inch under strain at elastic limit........................do.... .001267
Reduction in diameter at point of rupture........................do.... .014
Reduction in area after rupture, per centum of original section........................ 5 per cent.
Position of rupture........................1".90 from neck
Character of broken surface........................granular
Elongation of inch sections........................ ".02, ".02, ".02, ".02, ".02, ".02

No. 358.

Tension Test.

Mark on bar, 2
Diameter, ″.564.
Sectional area, .25 square inch.

There were two small blow-holes in this bar, both of which were turned out when the bar was reduced to ″.60 diameter.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033	....	....	
750	3,000	.000050	.000017	....	....	
1 000	4,000	.000067	.000017	....	....	
1.250	5,000	.000100	.000033	0.	....	
1 500	6,000	.000133	.000033	....	....	
1.750	7,000	.000150	.000017	....	....	
2,000	8,000	.000167	.000017	....	....	
2,250	9,000	.000200	.000033	....	....	
2,500	10,000	.000233	.000033	0.	....	
2,750	11,000	.000283	.000050	....	....	
3.000	12,000	.000317	.000034	....	....	
3,250	13,000	.000350	.000033	....	....	
3,500	14,000	.000383	.000033	....	....	
3,750	15,000	.000417	.000034	0.	....	
4,000	16,000	.000450	.000033	....	....	
4,250	17.000	.000483	.000033	....	....	
4.500	18,000	.000500	.000017	....	....	
4,750	19,000	.000533	.000033	....	....	
5,000	20,000	.000583	.000050	0.	....	
5,250	21,000	.000617	.000034	....	....	
5,500	22,000	.000650	.000033	....	....	
5,750	23,000	.000683	.000033	....	....	
6,000	24,000	.000700	000017	....	....	
6,250	25,000	.000717	.000017	.000033	.000033	
6,500	26,000	.000783	.000066	....	....	
6,750	27,000	.000800	.000017	....	....	
7.000	28,000	.000850	.000050	....	....	
7,250	29,000	.000867	.000017	....	....	
7,500	30,000	.000883	.000016	.000033	0.	
7,750	31,000	.000950	.000067	....	....	
8,000	32,000	.000967	.000017	....	....	
8.250	33,000	.001000	.000033	....	....	
8,500	34,000	.001033	.000033	....	....	
8,750	35,000	.001083	.000050	.000083	0.	
9,000	36,000	.001133	.000050	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001200	.000033	....	....	
9,750	39,000	.001233	.000033	....	....	
10,000	40,000	.001267	.000034	.000050	.000017	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001350	.000050	....	....	
10,750	43,000	.001383	.000033	....	....	Elastic limit.
11,000	44,000	.001450	.000067	....	....	
11,250	45,000	.001550	.000100	.000183	.000133	
11,500	46,000	.002050	.000500	....	....	
11,750	47,000	.002317	.000267	....	....	
12,000	48,000	.002967	.000650	....	....	
12,250	49,000	.003750	.000783	....	....	
12,500	50,000	.004467	.000757	.002650	....	Micrometer removed.
13,000	52,000	.0050	.000533	....	....	
13,500	54,000	.0067	.0017	....	....	
14,000	56,000	.0083	.0016	....	....	
14,500	58,000	.0100	.0017	....	....	
15,000	60,000	.0108	.0008	....	....	
15,500	62.000	.0117	.0009	....	....	
16,000	64,000	.0133	.0016	....	....	
16,500	66,000	.0142	.0009	....	....	
17.000	68,000	.0150	.0008	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch*	
17,500	70,000	.0158	.0008	....	....	
18,000	72,000	.0183	.0025	....	....	
18,280	73,120	....	....	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds	73,120
Elástic limit per square inch of original section	do	43,000
Elongation per inch after rupture	inch	0.0200
Elongation per inch under strain at elastic limit	do	.001383
Reduction in diameter at point of rupture	do	.014
Reduction in area after rupture, per centum of original section		5.0
Position of rupture		".25 from neck
Character of broken surface		granular
Elongation of inch sections		".02, ".02, ".01 (".3 fractured section), ",02, ".02

No. 359.

Tension Test.

Mark on bar, 3
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	0.	....	
5,000	20,000	.000583	.000150	0.	....	
5,250	21,000	.000617	.000034	....	....	
5,500	22,000	.000650	.000033	....	....	
5,750	23,000	.000667	.000017	....	....	
6,000	24,000	.000700	.000033	....	....	
6,250	25,000	.000733	.000033	0.	....	
6,500	26,000	.000767	.000034	....	....	
6,750	27,000	.000800	.000033	....	....	
7,000	28,000	.000833	.000033	....	....	
7,250	29,000	.000867	.000034	....	....	
7,500	30,000	.000917	.000050	.000017	.000017	
7,750	31,000	.000933	.000016	....	....	
8,000	32,000	.000967	.000034	....	....	
8,250	33,000	.001000	.000033	....	....	
8,500	34,000	.001067	.000067	....	....	
8,750	35,000	.001100	.000033	.000017	0.	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001150	.000017	....	....	
9,500	38,000	.001183	.000033	....	....	
9,750	39,000	.001233	.000050	....	....	
10,000	40,000	.001267	.000034	.000033	.000016	
10,250	41,000	.001300	.000033	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001367	.000034	....	....	
11,000	44,000	.001417	.000050	....	....	
11,250	45,000	.001450	.000033	.000050	.000017	
11,500	46,000	.001483	.000033	....	....	
11,750	47,000	.001517	.000034	....	....	
12,000	48,000	.001567	.000050	....	....	Elastic limit.
12,250	49,000	.001033	.000066	....	....	
12,500	50,000	.002033	.000400	.000433	.000383	
12,750	51,000	.002133	.000100	....	....	
13,000	52,000	.002383	.000250	....	....	
13,250	53,000	.002633	.000250	....	....	
13,500	54,000	.003133	.000500	....	....	
13,750	55,000	.003533	.000400	.001633	.001200	
14,000	56,000	.004083	.000550	....	....	
14,250	57,000	.004350	.000267	....	....	
14,500	58,000	.004917	.000567	....	....	
14,750	59,000	.005333	.000416	....	....	
15,000	60,000	.006217	000884	.003967	.002384	Micrometer removed.
15,500	62,000	.0067	.000483	....	....	
16,000	64,000	.0075	.0008	....	....	
16,500	66,000	.0092	.0017	....	....	
17,000	68,000	.0108	.0016	....	....	
17,500	70,000	.0125	.0017	....	....	
18,000	72,000	.0133	.0008	....	....	
18,500	74,000	.0150	.0017	....	....	
19,000	76,000	.0167	.0017	....	....	
19,500	78,000	.0183	.0016	....	....	
20,000	80,000	.0200	.0017	....	....	
20,500	82,000	.0217	.0017	....	....	
21,000	84,000	.0233	.0016	....	....	
21,500	86,000	.0250	.0017	....	....	
22,000	88,000	.0283	.0033	....	....	
22,500	90,000	.0317	.0034	....	....	
23,000	92,000	.0333	.0016	....	....	
23,500	94,000	.0367	.0034	....	....	
24,000	96,000	.0417	.0050	....	....	
24,360	97,440	....	....	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section ....pounds.. 97,440
Elastic limit per square inch of original section..do.... 48,000
Elongation per inch after rupture..inch.. 0.0383
Elongation per inch under strain at elastic limit..do.... .001567
Reduction in diameter at point of rupture ....do.... 0.34
Reduction in area after rupture, per centum of original section 11.8
Position of rupture..″.65 from neck
Character of broken surface ....granular
Elongation of inch sections..............................″.03, ″.03, ″.03, ″.03, ″.05 (″.95 fractured section)

No. 360.

Tension Test.

Mark on bar, 4
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000400	.000117	0.	....	
5,000	20,000	.000567	.000167	0.	....	
5,250	21,000	.000600	.000033	....	....	
5,500	22,000	.000633	.000033	....	....	
5,750	23,000	.000650	.000017	....	....	
6,000	24,000	.000683	.000033	....	....	
6,250	25,000	.000717	.000034	0.	....	
6,500	26,000	.000783	.000066	....	....	
6,750	27,000	.000800	.000017	....	....	
7,000	28,000	.000833	.000033	....	....	
7,250	29,000	.000867	.000034	....	....	
7,500	30,000	.000900	.000033	.000017	.000017	
7,750	31,000	.000967	.000067	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001033	.000033	....	....	
8,500	34,000	.001067	.000034	....	....	
8,750	35,000	.001100	.000033	.000050	.000033	Elastic limit.
9,000	36,000	.001167	.000067	....	....	
9,250	37,000	.001217	.000050	....	....	
9,500	38,000	.001283	.000066	....	....	
9,750	39,000	.001533	.000250	....	....	
10,000	40,000	.004633	.003100	.003217	.003167	
10,250	41,000	.004967	.000334	....	....	
10,500	42,000	.005467	.000500	....	....	
10,750	43,000	.006133	.000666	....	....	
11,000	44,000	.007217	.001084	....	....	
11,250	45,000	.007717	.000500	.006067	.002850	Micrometer removed.
11,500	46,000	.0083	.000583	....	....	
12,000	48,000	.0100	.0017	....	....	
12,500	50,000	.0117	.0017	....	....	
13,000	52,000	.0133	.0016	....	....	
13,500	54,000	.0150	.0017	....	....	
14,000	56,000	.0167	.0017	....	....	
14,500	58,000	.0183	.0016	....	....	
15,000	60,000	.0217	.0034	....	....	
15,500	62,000	.0233	.0016	....	....	
16,000	64,000	.0267	.0034	....	....	
16,500	66,000	.0283	.0016	....	....	
17,000	68,000	.0333	.0050	....	....	
17,500	70,000	.0350	.0017	....	....	
18,000	72,000	.0400	.0050	....	....	
18,500	74,000	.0433	.0033	....	....	
19,000	76,000	.0500	.0067	....	....	
19,500	78,000	.0583	.0083	....	....	
20,000	80,000	.0650	.0067	....	....	
20,500	82,000	.0783	.0133	....	....	
21,000	84,000	.0950	.0167	....	....	
21,500	86,000	.1250	.0300	....	....	
21,600	86,400	.1450	.0200	....	....	Ultimate strength.
16,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section....................pounds..: 86,400
Elastic limit per square inch of original section ....do.... 35,000
Elongation per inch after rupture....................inch.. 0.1483
Elongation per inch under strain at elastic limit....................do.... .001100
Reduction in diameter at point of rupture....................do.... .084
Reduction in area after rupture, per centum of original section.................... 27.6
Position of rupture.................... 1".20 from neck
Character of broken surface, granular, 60 per cent.; dull smoky, 40 per cent. The metal separated first at the dull, smoky section. Seven small cracks developed along the surface of the stem.
Elongation of inch sections ....",11, ".14, ".13, ".14, (".16 fractured section ".21)

No. 361.

Tension Test.

Mark on bar, 5
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000217	.000150	0.	....	
3,750	15,000	.000400	.000183	0.	....	
5,000	20,000	.000533	.000133	0.	....	
5,250	21,000	.000583	.000050	....	....	
5,500	22,000	.000617	.000034	....	....	
5,750	23,000	.000650	.000033	....	....	
6,000	24,000	.000667	.000017	....	....	
6,250	25,000	.000717	.000050	0.	....	
6,500	26,000	.000733	.000016	....	....	
6,750	27,000	.000800	.000067	....	....	
7,000	28,000	.000833	.000033	....	....	
7,250	29,000	.000867	.000034	....	....	
7,500	30,000	.000883	.000016	0.	....	
7,750	31,000	.000950	.000067	....	....	
8,000	32,000	.000983	.000033	....	....	
8,250	33,000	.001033	.000050	....	....	
8,500	34,000	.001083	.000050	....	....	
8,750	35,000	.001117	.000034	.000067	.000067	Elastic limit.
9,000	36,000	.001167	.000050	....	....	
9,250	37,000	.001233	.000066	....	....	
9,500	38,000	.001467	.000234	....	....	
9,750	39,000	.001917	.000450	....	....	
10,000	40,000	.005267	.003350	.003867	.003800	
10,230	41,000	.005567	.000300	....	....	
10,500	42,000	.006167	.000600	....	....	
10,750	43,000	.006800	.000633	....	....	
11,000	44,000	.007633	.000833	....	....	
11,250	45,000	.008383	.000750	.006700	.002833	
11,500	46,000	.008983	.000600	....	....	
11,750	47,000	.009700	.000717	....	....	
12,000	48,000	.010667	.000967	....	....	
12,250	49,000	.011467	.000800	....	....	
12,500	50,000	.012333	.000866	.010467	.003767	Micrometer removed.
13,000	52,000	.0133	.000967	....	....	
13,500	54,000	.0150	.0017	....	....	
14,000	56,000	.0183	.0033	....	....	
14,500	58,000	.0200	.0017	....	....	
15,000	60,000	.0217	.0017	....	....	
15,500	62,000	.0250	.0033	....	....	
16,000	64,000	.0283	.0033	....	....	
16,500	66,000	.0300	.0017	....	....	
17,000	68,000	.0350	.0050	....	....	
17,500	70,000	.0383	.0033	....	....	
18,000	72,000	.0417	.0034	....	....	
18,500	74,000	.0467	.0050	....	....	
19,000	76,000	.0533	.0066	....	....	
19,500	78,000	.0600	.0067	....	....	
20,000	80,000	.0700	.0100	....	....	
20,500	82,000	.0817	.0117	....	....	
21,000	84,000	.1000	.0183	....	....	
21,500	86,000	.1367	.0367	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	35,000
Elongation per inch after rupture	inch..	0.14
Elongation per inch under strain at elastic limit	do....	.001117
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".3 from neck

Character of broken surface, granular, 60 per cent.; dull spongy, 40 per cent. Seven small cracks developed along the surface of the stem.

Elongation of inch sections .... ".11, ".14, ".14, ".14, ".13 (".18 fractured section)

No. 362.

Tension Test.

Mark on bar, 6
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000283	.000183	0.	....	
3,750	15,000	.000417	.000134	0.	....	
5,000	20,000	.000567	.000150	0.	....	
5,250	21,000	.000600	.000033	....	....	
5,550	22,000	.000633	.000033	....	....	
5,750	23,000	.000667	.000034	....	....	
6,000	24,000	.000700	.000033	....	....	
6,250	25,000	.000750	.000050	.000017	.000017	
6,500	26,000	.000783	.000033	....	....	
6,750	27,000	.000817	.000034	....	....	
7,000	28,000	.000850	.000033	....	....	
7,250	29,000	.000883	.000033	....	....	
7,500	30,000	.000933	.000050	.000033	.000016	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001033	.000033	....	....	
8,500	34,000	.001083	.000050	....	....	
8,750	35,000	.001117	.000034	.000067	.000034	
9,000	36,000	.001167	.000050	....	....	
9,250	37,000	.001200	.000033	....	....	Elastic limit.
9,500	38,000	.001250	.000050	....	....	
9,750	39,000	.001333	.000083	....	....	
10,000	40,000	.002350	.000017	.001067	.001000	
10,250	41,000	.004833	.002483	....	....	
10,500	42,000	.005550	.000717	....	....	
10,750	43,000	.006000	.000450	....	....	
11,000	44,000	.006917	.000917	....	....	
11,250	45,000	.007950	.001033	.006250	.005183	
11,500	46,000	.008383	.000433	....	....	
11,750	47,000	.008900	.000517	....	....	
12,000	48,000	.009633	.000733	....	....	
12,250	49,000	.010367	.000734	....	....	
12,500	50,000	.011200	.000833	.009300	.003050	
13,000	52,000	.013067	.001867	....	....	
13,500	54,000	.014633	.001566	....	....	
14,000	56,000	.016633	.002000	....	....	
14,500	58,000	.018817	.002184	....	....	
15,000	60,000	.020883	.002066	....	....	Micrometer removed.
15,500	62,000	.0225	.001617	....	....	
16,000	64,000	.0250	.0025	....	....	
16,500	66,000	.0267	.0017	....	....	
17,000	68,000	.0300	.0033	....	....	
17,500	70,000	.0317	.0017	....	....	
18,000	72,000	.0350	.0033	....	....	
18,500	74,000	.0400	.0050	....	....	
19,000	76,000	.0467	.0067	....	....	
19,500	78,000	.0500	.0033	....	....	
20,000	80,000	.0583	.0083	....	....	
20,500	82,000	.0650	.0067	....	....	
21,000	84,000	.0750	.0100	....	....	
21,500	86,000	.0900	.0150	....	....	
22,000	88,000	.1217	.0317	....	....	
22,200	88,800	.1567	.0350	....	....	Ultimate strength.
21,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88,800
Elastic limit per square inch of original section	do ...	37,000
Elongation per inch after rupture	inch..	0.1717
Elongation per inch under strain at elastic limit	do....	.001200
Reduction in diameter at point of rupture	do....	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		".60 from middle of stem
Character of broken surface		granular, with a dull spot (30 per cent. of surface) at circumference
Elongation of inch sections		".12, ".17, ".16 (."25 fractured section), ".18 ".15

No. 363.

Tension Test.

Mark on bar, 7
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	**Initial load.**
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000200	.000100	0.	....	
3,750	15,000	.000367	.000167	0.	....	
5,000	20,000	.000517	.000150	0.	....	
5,250	21,000	.000550	.000033	....	....	
5,500	22,000	.000583	.000033	....	....	
5,750	23,000	.000633	.000050	....	....	
6,000	24,000	.000650	.000017	....	....	
6,250	25,000	.000667	.000017	0.	....	
6,500	26,000	.000700	.000033	....	....	
6,750	27,000	.000733	.000033	....	....	
7,000	28,000	.000767	.000034	....	....	
7,250	29,000	.000800	.000033	....	....	
7,500	30,000	.000833	.000033	0.	....	
7,750	31,000	.000867	.000034	....	....	
8,000	32,000	.000933	.000066	....	....	
8,250	33,000	.000967	.000034	....	....	
8,500	34,000	.001000	.000033	....	....	
8,750	35,000	.001033	.000033	0.	....	**Elastic limit.**
9,000	36,000	.001100	.000067	....	....	
9,250	37,000	.001217	.000117	....	....	
9,500	38,000	.001400	.000183	....	....	
9,750	39,000	.001633	.000233	....	....	
10,000	40,000	.002000	.000367	.000750	.000750	
10,250	41,000	.002383	.000383	....	....	
10,500	42,000	.002717	.000334	....	....	
10,750	43,000	.002900	.000183	....	....	
11,000	44,000	.003300	.000400	....	....	
11,250	45,000	.003717	.000417	.002317	.001567	
11,500	46,000	.004317	.000600	....	....	
11,750	47,000	.004883	.000566	....	....	
12,000	48,000	.005667	.000784	....	....	
12,250	49,000	.006217	.000550	....	....	
12,500	50,000	.006983	.000766	.005217	.002900	
13,000	52,000	.008467	.001484	....	....	
13,500	54,000	.009667	.001200	....	....	
14,000	56,000	.011033	.001366	....	....	
14,500	58,000	.012550	.001517	....	....	
15,000	60,000	.014700	.002150	....	....	
15,500	62,000	.0167	.0020	....	....	
16,000	64,000	.0183	.0016	....	....	
16,500	66,000	.0200	.0017	....	....	
17,000	68,000	.0233	.0033	....	....	
17,500	70,000	.0250	.0017	....	....	
18,000	72,000	.0267	.0017	....	....	
18,500	74,000	.0300	.0033	....	....	
19,000	76,000	.0317	.0017	....	....	
19,500	78,000	.0350	.0033	....	....	
20,000	80,000	.0400	.0050	....	....	
20,350	81,400	....	....	....	....	**Ultimate strength.**

General summary.

Tensile strength per square inch of original section	pounds	81,400
Elastic limit per square inch of original section	do	35,000
Elongation per inch after rupture	inch	0.04
Elongation per inch under strain at elastic limit	do	.001033
Reduction in diameter at point of rupture	do	.014
Reduction in area after rupture, per centum of original section		5.0
Position of rupture		″.50 from middle of stem
Character of broken surface		granular
Elongation of inch sections		″.03, ″.02, ″.03 (″.05 fractured section), ″.07, ″.04

No. 364.

Tension Test.

Mark on bar, 8
Diameter, ″.564.
Sectional area, .25 square inch.
Bar has blow-hole in the stem ″.04 diameter.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.		
2,500	10,000	.000250	.000167	0.		
3,750	15,000	.000383	.000133	0.		
5,000	20,000	.000550	.000167	0.		
5,250	21,000	.000567	.000017			
5,500	22,000	.000600	.000033			
5,750	23,000	.000633	.000033			
6,000	24,000	.000650	.000017			
6,250	25,000	.000683	.000033	0.		
6,500	26,000	.000700	.000017			
6,750	27,000	.000750	.000050			
7,000	28,000	.000800	.000050			
7,250	29,000	.000833	.000033			
7,500	30,000	.000850	.000017	0.		
7,750	31,000	.000883	.000033			
8,000	32,000	.000950	.000067			
8,250	33,000	.000983	.000033			
8,500	34,000	.001017	.000034			
8,750	35,000	.001033	.000016	.000017	.000017	
9,000	36,000	.001067	.000034			
9,250	37,000	.001117	.000050			
9,500	38,000	.001150	.000033			
9,750	39,000	.001183	.000033			Elastic limit.
10,000	40,000	.001533	.000350	.000383	.000366	
10,250	41,000	.002050	.000517			
10,500	42,000	.002633	.000583			
10,750	43,000	.002967	.000334			
11,000	44,000	.003533	.000566			
11,250	45,000	.004017	.000484	.002533	.002150	
11,500	46,000	.004467	.000450			
11,750	47,000	.004783	.000316			Micrometer removed.
12,000	48,000	.0058	.001017			
12,250	49,000	.0067	.0009			
12,500	50,000	.0083	.0016			
13,000	52,000	.0092	.0009			
13,500	54,000	.0117	.0025			
14,000	56,000	.0125	.0008			
14,500	58,000	.0133	.0008			
15,000	60,000	.0150	.0017			
15,500	62,000	.0167	.0017			
16,000	64,000	.0183	.0016			
16,500	66,000	.0200	.0017			
17,000	68,000	.0217	.0017			
17,500	70,000	.0250	.0033			
18,000	72,000	.0283	.0033			
18,500	74,000	.0300	.0017			
19,000	76,000	.0333	.0033			
19,500	78,000	.0367	.0034			
20,000	80,000	.0400	.0033			
20,500	82,000	.0450	.0050			
21,000	84,000	.0500	.0050			
21,010	84,040					Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds	84,040
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.05
Elongation per inch under strain at elastic limit	do	.001183
Reduction in diameter at point of rupture	do	.024
Reduction in area after rupture, per centum of original section		8.4
Position of rupture		″.80 from neck, and ″.60 from ″.04 blow-hole
Character of broken surface		granular
Elongation of inch sections		″.03, ″.03, ″.04, ″.06 ″.06, (″.08 fractured sections)

No. 365.

Tension Test.

Mark on bar, 9
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1, 000	0.	0.	0.	0.	Initial load.
1, 250	5, 000	.000067	.000067	0.		
2, 500	10. 000	.000217	.000150	0.		
3, 750	15, 000	.000367	.000150	0.		
5, 000	20, 000	.000550	.000183	0.		
5, 250	21, 000	.000567	.000017			
5, 500	22, 000	.000600	.000033			
5, 750	23, 000	.000633	.000033			
6, 000	24, 000	.000667	.000034			
6, 250	25, 000	.000700	.000033	0.		
6, 500	26, 000	.000733	.000033			
6, 750	27, 000	.000783	.000050			
7, 000	28, 000	.000817	.000034			
7, 250	29, 000	.000850	.000033			
7, 500	30, 000	.000917	.000067	.000033	.000033	
7, 750	31, 000	.000967	.000050			
8, 000	32, 000	.001000	.000033			
8, 250	33, 000	.001033	.000033			
8, 500	34, 000	.001083	.000050			
8, 750	35, 000	.001133	.000050	.000117	.000084	
9, 000	36, 000	.001183	.000050			Elastic limit.
9. 250	37, 000	.001267	.000084			
9, 500	38, 000	.001350	.000083			
9, 750	30, 000	.001550	.000200			
10, 000	40, 000	.003500	.001950	.002217	.002100	
10, 250	41, 000	.003817	.000317			
10, 500	42, 000	.004467	.000650			
10, 750	43, 000	.005133	.000666			
11, 000	44, 000	.005700	.000567			
11. 250	45, 000	.006300	.000600	.004783	.002566	
11, 500	46, 000	.007050	.000750			
11, 750	47, 000	.007700	.000650			
12, 000	48, 000	.008467	.000767			
12, 250	49, 000	.009200	.000733			
12, 500	50, 000	.010050	.000850	.008217	.003434	
13, 000	52, 000	.011650	.001600			
13, 500	54, 000	.013300	.001650			
14, 000	56, 000	.015383	.002083			
14, 500	58, 000	.017033	.001650			
15, 000	60, 000	.019000	.001967			Micrometer removed.
15, 500	62, 000	.0217	.0027			
16, 000	64, 000	.0233	.0016			
16, 500	66, 000	.0250	.0017			
17, 000	68, 000	.0283	.0033			
17, 500	70, 000	.0325	.0042			
18, 000	72, 000	.0350	.0025			
18, 500	74, 000	.0383	.0033			
19, 000	76, 000	.0433	.0050			
19, 500	78, 000	.0467	.0034			
20, 000	80, 000	.0550	.0083			
20, 500	82, 000	.0633	.0083			
21, 000	84, 000	.0717	.0084			
21, 500	86, 000	.0883	.0166			
21, 930	87, 720	.1133	.0250			Ultimate strength.
20, 800						Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	87, 720
Elastic limit per square inch of original section	do....	36, 000
Elongation per inch after rupture	inch..	0. 1117
Elongation per inch under strain at elastic limit	do....	.001183
Reduction in diameter at point of rupture	do....	.054
Reduction in area after rupture, per centum of original section		18. 3

Position of rupture .... ".50 from middle of stem
Character of broken surface......granular 70 per cent., dull spongy spot at circumference 30 per cent.
Elongation of inch sections ....".09, ".09, ".11 (".14 fractured section), ".18, ".11

No. 366.

Tension Test.

Mark on bar, 10
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.	....	
2,500	10,000	.000267	.000184	0.	....	
3,750	15,000	.000417	.000150	0.	....	
5,000	20,000	.000583	.000166	0.	....	
5,250	21,000	.000600	.000017	....	....	
5,500	22,000	.000633	.000033	....	....	
5,750	23,000	.000667	.000034	....	....	
6,000	24,000	.000700	.000033	....	....	
6,250	25,000	.000733	.000033	0.		
6,500	26,000	.000783	.000050	....	....	
6,750	27,000	.000833	.000050	....	....	
7,000	28,000	.000867	.000034	....	....	
7,250	29,000	.000917	.000050	....	....	
7,500	30,000	.000967	.000050	.000050	.000050	
7,750	31,000	.001000	.000033	....	....	
8,000	32,000	.001050	.000050	....	....	
8,250	33,000	.001083	.000033	....	....	
8,500	34,000	.001133	.000050	....	....	
8,750	35,000	.001167	.000034	.000100	.000050	
9,000	36,000	.001233	.000066	....	....	
9,250	37,000	.001283	.000050	....	....	Elastic limit.
9,500	38,000	.001383	.000100	....	....	
9,750	39,000	.001517	.000134	....	....	
10,000	40,000	.003217	.001700	.001867	.001767	
10,250	41,000	.003767	.000550	....	....	
10,500	42,000	.004333	.000566	....	....	
10,750	43,000	.004783	.000450	....	....	
11,000	44,000	.005883	.001100	....	....	
11,250	45,000	.006200	.000317	.004583	.002716	
11,500	46,000	.006800	.000600	....	....	
11,750	47,000	.007383	.000583	....	....	
12,000	48,000	.008300	.000917	....	....	
12,250	49,000	.008967	.000667	....	....	
12,500	50,000	.009700	.000733	.007783	.003200	
13,000	52,000	.011500	.001800	....	....	
13,500	54,000	.013267	.001767	....	....	
14,000	56,000	.014533	.001266	....	....	
14,500	58,000	.016750	.002217	....	....	
15,000	60,000	.018967	.002217	....	....	Micrometer removed.
15,500	62,000	.0208	.001833	....	....	
16,000	64,000	.0225	.0017	....	....	
16,500	66,000	.0250	.0025	....	....	
17,000	68,000	.0267	.0017	....	....	
17,500	70,000	.0317	.0050	....	....	
18,000	72,000	.0350	.0033	....	....	
18,500	74,000	.0383	.0033	....	....	
19,000	76,000	.0417	.0034	....	....	
19,500	78,000	.0483	.0066	....	....	
20,000	80,000	.0533	.0050	....	....	
20,500	82,000	.0600	.0067	....	....	
21,000	84,000	.0700	.0100	....	....	
21,500	86,000	.0833	.0133	....	....	
22,000	88,000	.1050	.0217	....	....	
22,200	88,800	.1283	.0233	....	....	Ultimate strength.
21,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	88,800
Elastic limit per square inch of original section	do....	37,000
Elongation per inch after rupture	inch..	0.1283
Elongation per inch under strain at elastic limit	do....	.001283
Reduction in diameter at point of rupture	do ...	.064
Reduction in area after rupture, per centum of original section		21.4
Position of rupture		1."30 from neck
Character of broken surface		granular, 50 per cent.; dull, spongy, 50 per cent.
Elongation of inch sections		".09, ".11, ".13, ".14 (".19 fractured section), ".11

No. 367.

Tension Test.

Mark on bar, 11
Diameter, ″.564.
Sectional area, .25 square inch.

Several small holes at intervals along the length of the stem were in sight when the bar was roughed out. They all turned out, except one ″⅛ diameter, 1¼″ from neck.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000083	.000083	0.		
2,500	10,000	.000233	.000150	0.		
3,750	15,000	.000400	.000167	0.		
5,000	20,000	.000567	.000167	0.		
5,250	21,000	.000583	.000016			
5,500	22,000	.000617	.000034			
5,750	23,000	.000650	.000033			
6,000	24,000	.000683	.000033			
6,250	25,000	.000700	.000017	.000017	.000017	
6,500	26,000	.000750	.000050			
6,750	27,000	.000783	.000033			
7,000	28,000	.000833	.000050			
7,250	29,000	.000850	.000017			
7,500	30,000	.000900	.000050	.000033	.000016	
7,750	31,000	.000950	.000050			
8,000	32,000	.001000	.000050			
8,250	33,000	.001033	.000033			
8,500	34,000	.001083	.000050			
8,750	35,000	.001117	.000034	.000050	.000017	
9,000	36,000	.001133	.000016			
9,250	37,000	.001167	.000034			
9,500	38,000	.001217	.000050			
9,750	39,000	.001283	.000066			
10,000	40,000	.001350	.000067	.000100	.000050	Elastic limit.
10,250	41,000	.001683	.000333			
10,500	42,000	.002150	.000467			
10,750	43,000	.003833	.001683			
11,000	44,000	.004700	.000867			
11,250	45,000	.005300	.000600	.003717	.003617	
11,500	46,000	.005983	.000683			
11,750	47,000	.006283	.000300			
12,000	48,000	.007033	.000750			
12,250	49,000	.007717	.000684			
12,500	50,000	.008633	.001116	.006750	.003083	
13,000	52,000	.009883	.001250			
13,500	54,000	.011283	.001400			
14,000	56,000	.012650	.001367			
14,500	58,000	.014133	.001483			
15,000	60,000	.016367	.002234			Micrometer removed.
15,500	62,000	.0183	.001933			
16,000	64,000	.0200	.0017			
16,500	66,000	.0225	.0025			
17,000	68,000	.0250	.0025			
17,500	70,000	.0267	.0017			
18,000	72,000	.0283	.0016			
18,500	74,000	.0317	.0034			
19,000	76,000	.0333	.0016			
19,500	78,000	.0367	.0034			
19,620	78,480					Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds..	78,480
Elastic limit per square inch of original section	do....	40,000
Elongation per inch after rupture	inch..	0.035
Elongation per inch under strain at elastic limit	do....	.001350
Reduction in diameter at point of rupture	do....	.024
Reduction in area after rupture, per centum of original section		8.4
Position of rupture		1″.50 from neck, and not at blow-hole
Character of broken surface		granular
Elongation of inch sections		″.03, ″.03, ″.03, ″.04 (″.5 fractured section), ″.03

No. 368.

Tension Test.

Mark on bar, 12
Diameter, ″.564.
Sectional area, .25 square inch.

There were two small blow-holes in sight when the stem was 1″ diameter; both turned out when the bar was turned down to ″.6 diameter.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.		
2,500	10,000	.000267	.000167	0.		
3,750	15,000	.000433	.000166	0.		
5,000	20,000	.000600	.000167	.000017	.000017	
5,250	21,000	.000617	.000017			
5,500	22,000	.000633	.000016			
5,750	23,000	.000667	.000034			
6,000	24,000	.000683	.000016			
6,250	25,000	.000717	.000034	.000033	.000016	
6,500	26,000	.000767	.000050			
6,750	27,000	.000800	.000033			
7,000	28,000	.000833	.000033			
7,250	29,000	.000867	.000034			
7,500	30,000	.000917	.000050	.000050	.000017	
7,750	31,000	.000933	.000016			
8,000	32,000	.000983	.000050			
8,250	33,000	.001017	.000034			
8,500	34,000	.001050	.000033			
8,750	35,000	.001083	.000033	.000050	0.	
9,000	36,000	.001100	.000017			
9,250	37,000	.001133	.000033			
9,500	38,000	.001183	.000050			
9,750	39,000	.001217	.000034			
10,000	40,000	.001267	.000050	.000067	.000017	
10,250	41,000	.001300	.000033			
10,500	42,000	.001367	.000067			
10,750	43,000	.001367	0.			Elastic limit.
11,000	44,000	.001433	.000066			
11,250	45,000	.001500	.000067	.000150	.000083	
11,500	46,000	.001700	.000200			
11,750	47,000	.002367	.000667			
12,000	48,000	.003067	.001300			
12,250	49,000	.004350	.000683			
12,500	50,000	.005000	.000650	.003250	.003100	
13,000	52,000	.006033	.001033			
13,500	54,000	.007133	.001100			
14,000	56,000	.008333	.001200			
14,500	58,000	.009700	.001367			
15,000	60,000	.010883	.001183			
15,500	62,000	.012333	.001450			
16,000	64,000	.013833	.001500			
16,500	66,000	.015250	.001417			
17,000	68,000	.016667	.001417			
17,500	70,000	.018433	.001766			Micrometer removed.
18,000	72,000	.0217	.003267			
18,500	74,000	.0225	.0008			
19,000	76,000	.0250	.0025			
19,500	78,000	.0267	.0017			
20,000	80,000	.0283	.0016			
20,500	82,000	.0317	.0034			
21,000	84,000	.0333	.0016			
21,500	86,000					Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds..	86,000
Elastic limit per square inch of original section	do....	43,000
Elongation per inch after rupture	inch..	0.0350
Elongation per inch under strain at elastic limit	do....	.001367
Reduction in diameter at point of rupture	do....	.014
Reduction in area after rupture, per centum of original section		5.0
Position of rupture		2″.10 fromneck, at a blow-hole ″.03 diameter and ¼″ deep
Character of broken surface		granular
Elongation of inch sections		″.02, ″.03, ″.03 (″.06 fractured section), ″.03, ″.04

No. 369.

Tension Test.

Mark on bar, 13
Diameter, ″.564.
Sectional area, .25 square inch.
Two blow-holes were in sight with stem 1⅛″ diameter; both turned out when stem was reduced to ″.6 diameter.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	.000017	.000017	
3,750	15,000	.000450	.000167	.000017	0.	
5,000	20,000	.000600	.000150	.000033	.000016	
5,250	21,000	.000617	.000017	....	....	
5,500	22,000	.000633	.000016	....	....	
5,750	23,000	.000667	.000034	....	....	
6,000	24,000	.000717	.000050	....	....	
6,250	25,000	.000750	.000033	.000050	.000017	
6,500	26,000	.000783	.000033	....	....	
6,750	27,000	.000817	.000034	....	....	
7,000	28,000	.000850	.000033	....	....	
7,250	29,000	.000883	.000033	....	....	
7,500	30,000	.000917	.000034	.000050	0.	
7,750	31,000	.000967	.000050	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001033	.000033	....	....	
8,500	34,000	.001083	.000050	....	....	
8,750	35,000	.001117	.000034	.000067	.000017	
9,000	36,000	.001133	.000016	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001217	.000050	....	....	
9,750	39,000	.001233	.000016	....	....	
10,000	40,000	.001283	.000050	.000083	.000016	
10,250	41,000	.001300	.000017	....	....	
10,500	42,000	.001333	.000033	....	....	
10,750	43,000	.001383	.000050	....	....	
11,000	44,000	.001433	.000050	....	....	
11,250	45,000	.001483	.000050	.000117	.000034	
11,500	46,000	.001533	.000050	....	....	
11,750	47,000	.001550	.000017	....	....	Elastic limit.
12,000	48,000	.001967	.000417	....	....	
12,250	49,000	.002633	.000666	....	....	
12,500	50,000	.004350	.001717	.002583	.002466	
13,000	52,000	.005233	.000883	....	....	
13,500	54,000	.006217	.000984	....	....	
14,000	56,000	.007483	.001266	....	....	
14,500	58,000	.008717	.001234	....	....	
15,000	60,000	.010050	.001333	....	....	
15,500	62,000	.011517	.001467	....	....	
16,000	64,000	.012833	.001316	....	....	
16,500	66,000	.014400	.001567	....	....	
17,000	68,000	.016000	.001600	....	....	
17,500	70,000	.017967	.001967	....	....	Micrometer removed.
18,000	72,000	.0217	.003733	....	....	
18,500	74,000	.0233	.0016	....	....	
19,000	76,000	.0250	.0017	....	....	
19,500	78,000	.0275	.0025	....	....	
20,000	80,000	.0292	.0017	....	....	
20,500	82,000	.0317	.0025	....	....	
21,000	84,000	.0367	.0050	....	....	Ultimate strength.
20,500	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	84,000
Elastic limit per square inch of original section	do....	48,000
Elongation per inch after rupture	inch..	0.0350
Elongation per inch under strain at elastic limit	do....	.001350
Reduction in diameter at point of rupture	do....	.024
Reduction in area after rupture, per centum of original section		8.4
Position of rupture		″.35 from neck

Character of broken surface, granular, 80 per cent.; dull spot at circumference, 20 per cent. A number of crystals with very bright facets are contained in this dull spot.

Elongation of inch sections ....″.03, ″.03, ″.03, ″.03 ″.03 (″.06 fractured section)

No. 370.

Tension Test.

Mark on bar, 14
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000067	.000067	0.	....	
2,500	10,000	.000217	.000150	0.	....	
3,750	15,000	.000367	.000150	0.	....	
5,000	20,000	.000500	.000133	0.	....	
5,250	21,000	.000550	.000050	....	....	
5,500	22,000	.000600	.000050	....	....	
5,750	23,000	.000617	.000017	....	....	
6,000	24,000	.000633	.000016	....	....	
6,250	25,000	.000683	.000050	0.	....	
6,500	26,000	.000717	.000034	....	....	
6,750	27,000	.000750	.000033	....	....	
7,000	28,000	.000783	.000033	....	....	
7,250	29,000	.000833	.000050	....	....	
7,500	30,000	.000867	.000034	.000017	.000017	
7,750	31,000	.000933	.000066	....	....	
8,000	32,000	.000967	.000034	....	....	
8,250	33,000	.001000	.000033	....	....	
8,500	34,000	.001050	.000050	....	....	
8,750	35,000	.001100	.000050	.000050	.000033	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001183	.000050	....	....	
9,375	37,500	.001200	.000017	....	....	Elastic limit.
9,500	38,000	.001300	.000100	....	....	
....	....	.004383	.003083	....	....	
9,750	39,000	.006767	.002384	....	....	
10,000	40,000	.008050	.001283	.006567	.006517	
10,250	41,000	.008550	.000500	....	....	
10,500	42,000	.009450	.000900	....	....	
10,750	43,000	.009967	.000517	....	....	
11,000	44,000	.011250	.001283	....	....	
11,250	45,000	.012033	.000783	.010350	.003783	
11,500	46,000	.012833	.000800	....	....	
11,750	47,000	.013800	.000967	....	....	
12,000	48,000	.014867	.001067	....	....	
12,250	49,000	.015533	.000666	....	....	
12,500	50,000	.017000	.001467	.014967	.004617	
13,000	52,000	.018850	.001850	....	....	
13,500	54,000	.021483	.002633	....	....	
14,000	56,000	.023750	.002267	....	....	
14,500	58,000	.027217	.003467	....	....	
15,000	60,000	.029817	.002600	....	....	Micrometer removed.
15,500	62,000	.0333	.003483	....	....	
16,000	64,000	.0383	.0050	....	....	
16,500	66,000	.0433	.0050	....	....	
17,000	68,000	.0467	.0034	....	....	
17,500	70,000	.0550	.0083	....	....	
18,000	72,000	.0600	.0050	....	....	
18,500	74,000	.0700	.0100	....	....	
19,000	76,000	.0800	.0100	....	....	
19,500	78,000	.0983	.0183	....	....	
20,000	80,000	.1283	.0300	....	....	
20,120	80,480	.1567	.0284	....	....	Ultimate strength.
19,300	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	80,480
Elastic limit per square inch of original section	do....	37,500
Elongation per inch after rupture	inch..	0.18
Elongation per inch under strain at elastic limit	do ...	.001200
Reduction in diameter at point of rupture	do....	.094
Reduction in area after rupture, per centum of original section		30.6
Position of rupture		″.80 from neck, taking an oblique course across bar
Character of broken surface		dull, smoky
Elongation of inch sections		″.12, ″.12, ″.15, ″.18, ″.25 (″.26 fractured section)

No. 371.

Tension Test.

Mark on bar, 15
Diameter, ''.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000217	.000117	0.	....	
3,750	15,000	.000367	.000150	0.	....	
5,000	20,000	.000533	.000166	0.	....	
5,250	21,000	.000567	.000034	....	....	
5,500	22,000	.000600	.000033	....	....	
5,750	23,000	.000633	.000033	....	....	
6,000	24,000	.000667	.000034	....	....	
6,250	25,000	.000683	.000016	0.	....	
6,500	26,000	.000733	.000050	....	....	
6,750	27,000	.000767	.000034	....	....	
7,000	28,000	.000800	.000033	....	....	
7,250	29,000	.000833	.000033	....	....	
7,500	30,000	.000867	.000034	.000017	.000017	
7,750	31,000	.000933	.000066	....	....	
8,000	32,000	.000983	.000050	....	....	
8,250	33,000	.001017	.000034	....	....	
8,500	34,000	.001067	.000050	....	....	
8,750	35,000	.001100	.000033	.000033	.000016	
9,000	36,000	.001133	.000033	....	....	
9,250	37,000	.001167	.000034	....	....	
9,500	38,000	.001233	.000066	....	....	Elastic limit.
9,750	39,000	.003450	.002217	....	....	
10,000	40,000	.006883	.003433	.005450	.005417	
10,250	41,000	.007333	.000450	....	....	
10,500	42,000	.008050	.000717	....	....	
10,750	43,000	.008700	.000650	....	....	
11,000	44,000	.009367	.000667	....	....	
11,250	45,000	.010133	.000766	.00[illegible]67	.003017	
11,500	46,000	.010833	.000700	....	....	
11,750	47,000	.011500	.000667	....	....	
12,000	48,000	012700	.001200	....	....	
12,250	49,000	.013633	.000933	....	....	
12,500	50,000	.014733	.001100	.012717	.004250	
13,000	52,000	.016633	.001900	....	....	
13,500	54,000	.018050	.001417	....	....	
14,000	56,000	.020417	.002360	....	....	
14,500	58,000	.022850	.002433	....	....	
15,000	60,000	.025000	.002150	....	....	
15,500	62,000	.028667	.003667	....	....	
16,000	64,000	.030833	.002166	....	....	Micrometer removed.
16,500	66,000	.0342	.003367	....	....	
17,000	68,000	.0367	.0025	....	....	
17,500	70,000	.0417	.0050	....	....	
18,000	72,000	.0467	.0050	....	....	
18,500	74,000	.0567	.0100	....	....	
19,000	76,000	.0633	.0066	....	....	
19,500	78,000	.0733	.0100	....	....	
20,000	80,000	.0833	.0100	....	....	
20,450	81,800	....	....	....	....	Ultimate strength.
16,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section..................................pounds.. 81,800
Elastic limit per square inch of original section..do.... 38,000
Elongation per inch after rupture ....inch.. 0.0983
Elongation per inch under strain at elastic limit ....do ... .001233
Reduction in diameter at point of rupture . ...do.... .051
Reduction in area after rupture, per centum of original section 18 3
Position of rupture .... ''.70 from neck
Character of broken surface, granular, 60 per cent.; dull spongy, 40 per cent. The bar began to fracture at one side, gradually tearing apart. The part fracturing first presents a dull spongy appearance. An oblique crack opened ¼'' from the point of rupture.
Elongation of inch sections .... ''.10, ''.09, ''.09, ''.10, ''.08 (''.13 fractured section)

No. 372.

Tension Test.

Mark on bar, 16
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000100	.000100	0.	....	
2,500	10,000	.000267	.000167	0.	....	
3,750	15,000	.000417	.000150	0.	....	
5,000	20,000	.000567	.000150	0.	....	
5,250	21,000	.000617	.000050	....	....	
5,500	22,000	.000650	.000033	....	....	
5,750	23,000	.000683	.000033	....	....	
6,000	24,000	.000700	.000017	....	....	
6,250	25,000	.000733	.000033	.000033	.000033	
6,500	26,000	.000783	.000050	....	....	
6,750	27,000	.000817	.000034	....	....	
7,000	28,000	.000850	.000033	....	....	
7,250	29,000	.000883	.000033	....	....	
7,500	30,000	.000933	.000050	.000033	0.	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.001000	.000033	....	....	
8,250	33,000	.001033	.000033	....	....	
8,500	34,000	.001083	.000050	....	....	
8,750	35,000	.001100	.000017	.000050	.000017	
9,000	36,000	.001133	.000033	....	....	Elastic limit.
9,250	37,000	.001200	.000067	....	....	
9,500	38,000	.001267	.000067	....	....	
9,750	39,000	.001450	.000183	....	....	
10,000	40,000	.004500	.003050	.003233	.003183	
10,250	41,000	.006683	.002183	....	....	
10,500	42,000	.007217	.000534	....	....	
10,750	43,000	.008000	.000783	....	....	
11,000	44,000	.008583	.000583	....	....	
11,250	45,000	.009467	.000884	.007800	.004567	
11,500	46,000	.010333	.000866	....	....	
11,750	47,000	.010883	.000550	....	....	
12,000	48,000	.011800	.000917	....	....	
12,250	49,000	.012633	.000833	....	....	
12,500	50,000	.013667	.001034	.011700	.003900	
13,000	52,000	.015067	.001400	....	....	
13,500	54,000	.016983	.001916	....	....	
14,000	56,000	.018967	.001984	....	....	
14,500	58,000	.021167	.002200	....	....	
15,000	60,000	.023333	.002166	....	....	
15,500	62,000	.025967	.002634	....	....	
16,000	64,000	.028833	.002866	....	....	Micrometer removed.
16,500	66,000	.0317	.002867	....	....	
17,000	68,000	.0350	.0033	....	....	
17,500	70,000	.0383	.0033	....	....	
18,000	72,000	.0417	.0034	....	....	
18,500	74,000	.0483	.0066	....	....	
19,000	76,000	.0550	.0067	....	....	
19,500	78,000	.0633	.0083	....	....	
19,960	79,840	.0717	.0084	....	....	Ultimate strength.
19,600	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	79,840
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.0683
Elongation per inch under strain at elastic limit	do....	.001133
Reduction in diameter at point of rupture	do....	.034
Reduction in area after rupture, per centum of original section		11.2

Position of rupture.............................″.75 from middle of stem

Character of broken surface, granular, radiating from a dull spot at the circumference where the fracture began. Fracture began at one side.

Elongation of inch sections..............................″.05, ″.06, ″.07 (″.08 fractured section), ″.07, ″.06

No. 373.

Tension Test.

Mark on bar, 17
Diameter, ".564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	.000033	.000033	
2,500	10,000	.000317	.000200	.000033	0.	
3,750	15,000	.000483	.000166	.000050	.000017	
5,000	20,000	.000650	.000167	.000050	0.	
5,250	21,000	.000667	.000017	....	....	
5,500	22,000	.000717	.000050	....	....	
5,750	23,000	.000767	.000050	....	....	
6,000	24,000	.000800	.000033	....	....	
6,250	25,000	.000833	.000033	.000083	.000033	
6,500	26,000	.000867	.000034	....	....	
6,750	27,000	.000900	.000033	....	....	
7,000	28,000	.000933	.000033	....	....	
7,250	29,000	.000967	.000034	....	....	
7,500	30,000	.001000	.000033	.000100	.000100	
7,750	31,000	.001050	.000050	....	....	
8,000	32,000	.001100	.000050	....	....	
8,250	33,000	.001117	.000017	....	....	
8,500	34,000	.001167	.000050	....	....	
8,750	35,000	.001200	.000033	.000117	.000017	
9,000	36,000	.001250	.000050	....	....	
9,250	37,000	.001283	.000033	....	....	
9,500	38,000	.001333	.000050	....	....	
9,750	39,000	.001383	.000050	....	....	Elastic limit.
10,000	40,000	.002200	.000817	.000950	.000833	
10,250	41,000	.003917	.001717	....	....	
10,500	42,000	.004783	.000866	....	....	
10,750	43,000	.005317	.000534	....	....	
11,000	44,000	.006483	.001166	....	....	
11,250	45,000	.007083	.000600	.005450	.004500	
11,500	46,000	.007750	.000667	....	....	
11,750	47,000	.008233	.000483	....	....	
12,000	48,000	.009583	.001350	....	....	
12,250	49,000	.009883	.000300	....	....	
12,500	50,000	.010550	.000667	.008600	.003150	
13,000	52,000	.011867	.001317	....	....	
13,500	54,000	.013800	.001933	....	....	
14,000	56,000	.015917	.002117	....	....	
14,500	58,000	.017083	.001166	....	....	
15,000	60,000	.019300	.002217	....	....	
15,500	62,000	.020967	.001667	....	....	
15,920	63,680	....	....	....	....	Ultimate strength.

General summary.

Specific gravity		7.8519
Hardness		17.35
Tensile strength per square inch of original section	pounds	63,680
Elastic limit per square inch of original section	do	39,000
Elongation per inch after rupture	inch	0.0217
Elongation per inch under strain at elastic limit	do	.001383
Reduction in diameter at point of rupture	do	.004
Reduction in area after rupture, per centum of original section		1.5
Position of rupture		at the neck
Character of broken surface		granular
Elongation of inch sections		".02, ".02, ".02, ".02, ".02, ".03

No. 374.

Tension Test.

Mark on bar, 18
Diameter, ″.564.
Sectional area, .25 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000117	.000117	0.	....	
2,500	10,000	.000283	.000166	0.	....	
3,750	15,000	.000433	.000150	.000017	.000017	
5,000	20,000	.000583	.000150	.000017	0.	
5,250	21,000	.000600	.000017	....	....	
5,500	22,000	.000633	.000033	....	....	
5,750	23,000	.000667	.000034	....	....	
6,000	24,000	.000700	.000033	....	....	
6,250	25,000	.000733	.000033	.000050	.000033	
6,500	26,000	.000800	.000067	....	....	
6,750	27,000	.000833	.000033	....	....	
7,000	28,000	.000867	.000034	....	....	
7,250	29,000	.000883	.000016	....	....	
7,500	30,000	.000933	.000050	.000067	.000017	
7,750	31,000	.000967	.000034	....	....	
8,000	32,000	.001017	.000050	....	....	
8,250	33,000	.001050	.000033	....	....	
8,500	34,000	.001100	.000050	....	....	
8,750	35,000	.001133	.000033	.000100	.000033	
9,000	36,000	.001150	.000017	....	....	Elastic limit.
9,250	37,000	.001217	.000067	....	....	
9,500	38,000	.001283	.000066	....	....	
9,750	39,000	.002283	.001000	....	....	
10,000	40,000	.003467	.001084	.002133	.002033	
10,250	41,000	.004300	.000833	....	....	
10,500	42,000	.005300	.001000	....	....	
10,750	43,000	.006250	.000950	....	....	
11,000	44,000	.007133	.000883	....	....	
11,250	45,000	.007550	.000417	.005967	.003834	
11,500	46,000	.008183	.000633	....	....	
11,750	47,000	.008967	.000784	....	....	
12,000	48,000	.009833	.000806	....	....	
12,250	49,000	.010633	.000800	....	....	
12,500	50,000	.011483	.000850	.009533	.003566	
13,000	52,000	.012833	.001350	....	....	
13,500	54,000	.014500	.001667	....	....	
14,000	56,000	.016033	.001533	....	....	
14,500	58,000	.018367	.002334	....	....	
15,000	60,000	.020317	.001950	....	....	Micrometer removed.
15,500	62,000	.0233	.002983	....	....	
16,000	64,000	.0258	.0025	....	....	
16,500	66,000	.0300	.0042	....	....	
17,000	68,000	.0317	.0017	....	....	
17,500	70,000	.0342	.0025	....	....	
18,000	72,000	.0383	.0041	....	....	
18,500	74,000	.0417	.0034	....	....	
19,000	76,000	.0450	.0033	....	....	Snapping sounds.
19,500	78,000	.0533	.0083	....	....	
19,800	79,200	....	....	....	....	Ultimate strength.

General summary.

Tensile strength per square inch of original section	pounds..	79,200
Elastic limit per square inch of original section	do....	36,000
Elongation per inch after rupture	inch..	0.0517
Elongation per inch under strain at elastic limit	do....	.001150
Reduction in diameter at point of rupture		not obtained
Reduction in area after rupture, per centum of original section		not obtained
Position of rupture		at the neck
Character of broken surface		granular
Elongation of inch sections		″.04, ″.06, ″.06, ″.06, ″.04 (″.05 fractured section)

No. 401.

Compression Test.

Mark on bar, 19

Length, 8''.738.

Diameter, 1''.129.

Sectional area, 1 square inch.

There were two blow-holes in sight when the bar was 1⅜'' diameter, one ''.20×''.10, 2½'' from end nearly turned out; one ''.10×''.10 did not turn out when bar was brought to finished size. Numerous small pin-holes in sight.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load
5, 000	5, 000	.000100	.000100	0.	....	
10, 000	10, 000	.000250	.000150	0.	....	
15, 000	15, 000	.000417	.000167	0.	....	
20, 000	20, 000	.000600	.000183	.000017	.000017	
21, 000	21, 000	.000617	.000017	....	....	
22, 000	22, 000	.000667	.000050	....	....	
23, 000	23, 000	.000717	.000050	....	....	
24, 000	24, 000	.000767	.000050	....	....	
25, 000	25, 000	.000800	.000033	.000033	.000016	
26, 000	26, 000	.000833	.000033	....	....	
27, 000	27, 000	.000867	.000034	....	....	
28, 000	28, 000	.000900	.000033	....	....	
29, 000	29, 000	.000933	.000033	....	....	
30, 000	30, 000	.000967	.000034	.000050	.000017	
31, 000	31, 000	.000983	.000016	....	....	
32, 000	32, 000	.001033	.000050	....	....	
33, 000	33, 000	.001067	.000034	....	....	
34, 000	34, 000	.001100	.000033	....	....	
35, 000	35. 000	.001133	.000033	.000067	.000017	
36, 000	36. 000	.001183	.000050	....	....	
37, 000	37, 000	.001217	.000034	....	....	
38, 000	38 000	.001250	.000033	....	....	
39, 000	39, 000	.001283	.000033	....	....	Elastic limit.
40, 000	40, 000	.001367	.000084	.000083	.000016	
		.003500	.002133	....	....	Rapid deflection.
41, 000	41, 000	.005833	.002333	....	....	
42, 000	42, 000	.007000	.001167	....	....	
43, 000	43, 000	.007917	.000917	....	....	
44, 000	44, 000	.008417	.000500	....	....	
45, 000	45, 000	.008917	.000500	....	....	
46, 000	46, 000	.009467	.000550	....	....	
47, 000	47, 000	.010100	.000633	....	....	
48, 000	48, 000	.010667	.000567	....	....	
49, 000	49, 000	.011333	.000666	....	....	
50, 000	50, 000	.012067	.000734	.010167	.010084	
67, 400	67, 400	....	....	....	....	Ultimate strength.
60, 000	....	....	....	....	....	Load sustained when test was discontinued.

General summary.

Elastic limit per square inch of original section	pounds..	39, 000
Compression per inch under stress at elastic limit	inch..	0. 001283
Ultimate strength per square inch of original section	pounds..	67, 400
Manner of failure		triple flexure
Middle deflection after the test		''.45

No. 402.

Compression Test.

Mark on bar, 20
Length, 8″.742.
Diameter, 1″.129.
Sectional area, 1 square inch.

Blow-hole $\frac{1}{4}''$ × $\frac{1}{8}''$ near the middle of bar; also one $\frac{1}{16}''$ diameter near the end.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
5,000	5,000	.000133	.000133	0.	....	
10,000	10,000	.000300	.000167	.000017	.000017	
15,000	15,000	.000433	.000133	.000017	0.	
20,000	20,000	.000633	.000200	.000033	.000016	
21,000	21,000	.000667	.000034	....	....	
22,000	22,000	.000700	.000033	....	....	
23,000	23,000	.000750	.000050	....	....	
24,000	24,000	.000783	.000033	....	....	
25,000	25,000	.000817	.000034	.000050	.000017	
26,000	26,000	.000833	.000016	....	....	
27,000	27,000	.000867	.000034	....	....	
28,000	28,000	.000900	.000033	....	....	
29,000	29,000	.000933	.000033	....	....	
30,000	30,000	.000967	.000034	.000067	.000017	
31,000	31,000	.001017	.000050	....	....	
32,000	32,000	.001050	.000033	....	....	
33,000	33,000	.001083	.000033	....	....	
34,000	34,000	.001117	.000034	....	....	
35,000	35,000	.001150	.000033	.000100	.000033	
36,000	36,000	.001200	.000050	....	....	
37,000	37,000	.001233	.000033	....	....	
38,000	38,000	.001300	.000067	....	....	
39,000	39,000	.001350	.000050	....	....	Elastic limit.
40,000	40,000	....	....	....	....	Sustained momentarily, then pressure fell, accompanied by deflection of the bar.
38,000	38,000	.002217	.000867	....	....	
38,500	38,500	.002400	.000183	....	....	
39,000	39,000	.002767	.000367	....	....	
39,500	39,500	.003550	.000783	....	....	
40,000	40,000	.004600	.001050	.003267	.003167	
41,000	41,000	.005950	001350	....	....	
42,000	42,000	.006683	.000733	....	....	
43,000	43,000	.007450	.000767	....	....	
44,000	44,000	.008067	.000617	....	....	
45,000	45,000	.008717	.000650	.007067	.003800	
46,000	46,000	.009250	.000533	....	....	
47,000	47,000	.009750	.000500	....	....	
48,000	48,000	.010250	.000500	....	....	
49,000	49,000	.010867	.000617	....	....	
50,000	50,000	.011500	.000633	....	....	
65,980	65,980	....	....	....	....	Ultimate strength.
50,000	....	....	....	....	....	Load sustained when test was discontinued.

General summary.

Elastic limit per square inch of original section..........pounds.. 39,000
Compression per inch under stress of elastic limit..........inch.. 0.001350
Ultimate strength per square inch of original section..........pounds.. 65,980
Manner of failure..........triple flexure; metal ruptured in vicinity of blow-hole at middle of bar
Middle deflection after the test.......... ″.08

No. 403.

Compression Test.

Mark on bar, 21
Length, 8″.837.
Diameter, 1″.129.
Sectional area, 1 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	Initial load.
5, 000	5, 000	.000150	.000150	.000017	.000017	
10, 000	10, 000	.000300	.000150	.000017	0.	
15, 000	15, 000	.000483	.000183	.000050	.000033	
20, 000	20, 000	.000667	.000184	.000067	.000017	
21, 000	21, 000	.000683	.000016	....	....	
22, 000	22, 000	.000733	.000050	....	....	
23, 000	23, 000	.000767	.000034	....	....	
24, 000	24, 000	.000800	.000033	....	....	
25, 000	25, 000	.000833	.000033	.000067	0.	
26, 000	26, 000	.000867	.000034	....	....	
27, 000	27, 000	.000917	.000050	....	....	
28, 000	28, 000	.000950	.000033	....	....	
29, 000	29, 000	.000967	.000017	....	....	
30, 000	30, 000	.001000	.000033	.000083	.000016	
31, 000	31, 000	.001033	.000033	....	....	
32, 000	32, 000	.001067	.000034	....	....	
33, 000	33, 000	.001100	.000033	....	....	
34, 000	34, 000	.001133	.000033	....	....	
35, 000	35, 000	.001167	.000034	.000083	0.	
36, 000	36, 000	.001200	.000033	....	....	
37, 000	37, 000	.001233	.000033	....	....	
38, 000	38, 000	.001267	.000034	....	....	
39, 000	39, 000	.001300	.000033	....	....	
40, 000	40, 000	.001333	.000033	.000100	.000017	
41, 000	41, 000	.001367	.000034	....	....	
42, 000	42, 000	.001417	.000050	....	....	
43, 000	43, 000	.001450	.000033	....	....	
44, 000	44, 000	.001467	.000017	....	....	
45, 000	45, 000	.001517	.000050	.000133	.000033	Elastic limit.
46, 000	46, 000	.001583	.000066	....	....	
47, 000	47, 000	.001650	.000067	....	....	
48, 000	48, 000	.004933	.003283	....	....	Rapid deflection.
49, 000	49, 000	.005617	.000684	....	....	
50, 000	50, 000	.006167	.000550	.004317	.004184	
74, 800	74, 800	....	....	....	....	Ultimate strength.
50, 000	....	....	....	....	....	Load sustained when test was discontinued.

General summary.

Elastic limit per square inch of original section ....pounds.. 45, 000
Compression per inch under stress at elastic limit..........inch.. 0. 001517
Ultimate strength per square inch of original section ....pounds.. 74, 800
Manner of failure.......... triple flexure
Middle deflection after the test..........″. 80

No. 404.

Compression Test.

Mark on bar, 22
Length, 8''.842.
Diameter, 1''.129.
Sectional area, 1 square inch.

Several small blow-holes were found on one side of bar, many of which turned out in reducing specimen to finished size. Spongy spot $\frac{1}{4}'' \times \frac{1}{16}$, $1\frac{1}{2}''$ from end.

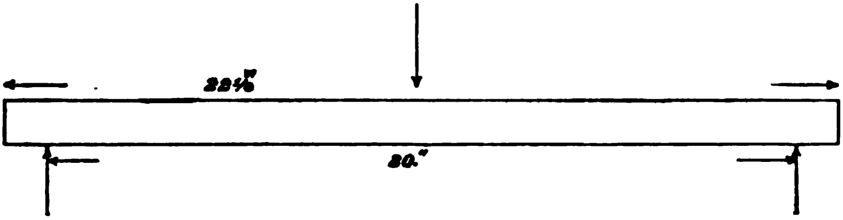
Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
500	500	0.	0.	0.	0.	**Initial load.**
5, 000	5, 000	.000133	.000133	0.		
10, 000	10, 000	.000317	.000184	.000067	.000067	
15, 000	15, 000	.000467	.000150	.000083	.000016	
20, 000	20, 000	.000633	.000166	.000083	0.	
21, 000	21, 000	.000667	.000034			
22, 000	22, 000	.000717	.000050			
23, 000	23, 000	.000767	.000050			
24, 000	24, 000	.000800	.000033			
25, 000	25, 000	.000817	.000017	.000100	.000017	
26, 000	26, 000	.000833	.000016			
27, 000	27, 060	.000850	.000017			
28, 000	28, 000	.000900	.000050			
29, 000	29, 000	.000950	.000050			
30, 000	30, 000	.001000	.000050	.000117	.000017	
31 000	31, 000	.001017	.000017			
32, 000	32, 000	.001067	.000050			
33, 000	33, 000	.001100	.000033			
34, 000	34, 000	.001133	.000033			
35, 000	35, 000	.001150	.000017	.000117	0.	
36, 000	36, 000	.001167	.000017			
37, 000	37, 000	.001217	.000050			
38, 000	38, 000	.001250	.000033			
39, 000	39, 000	.001300	.000050			
40, 000	40, 000	.001333	.000033	.000117	0.	
41, 000	41, 000	.001367	.000034			
41, 350	41, 350	.001400	.000033			**Elastic limit.**
		.001883	.000483			
41, 500	41, 500	.002333	.000450			**Perceptible deflection.**
42, 000	42, 000	.002750	.000417			
43, 000	43, 000	.003650	.000900			
44, 000	44, 000	.004133	.000483			
45, 000	45, 000	.004550	.000417	.002900	.002783	
46, 000	46, 000	.004833	.000283			
47, 000	47, 000	.005200	.000367			
48, 000	48, 000	.005600	.000400			
49, 000	49, 000	.006067	.000467			
50, 000	50, 000	.006433	.000366	.004633	.001733	
65, 700	65, 700					**Ultimate strength.**
50, 000						**Load sustained when test was discontinued.**

General summary.

Elastic limit per square inch of original section	**pounds..**	**41, 350**
Compression per inch under stress at elastic limit	**inch..**	**0. 001400**
Ultimate strength per square inch of original section	**pounds..**	**65, 700**
Manner of failure		**triple flexure**
Middle deflection after the test		**''. 82**

No. 3.

Transverse Test.



Mark on bar, 23
Diameter, 1".129.
Loaded at the middle.
End supports 20" apart.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
0.	0.	0.	0.	
56	2,000	.0040	....	
113	4,000	.0083	....	
169	6,000	.0119	....	
226	8,000	.0160	....	
282	10,000	.0195	.0001	
339	12,000	.0235	....	
395	14,000	.0275	....	
452	16,000	.0315	....	
508	18,000	.0349	....	
565	20,000	.0385	.0006	
621	22,000	.0418	....	
678	24,000	.0452	....	
734	26,000	.0488	....	
791	28,000	.0321	....	
847	30,000	.0560	.0009	
904	32,000	.0597	....	
960	34,000	.0635	....	
1,017	36,000	.0673	....	
1,073	38,000	.0708	....	
1,130	40,000	.0747	.0017	
1,186	42,000	.0795	....	
1,243	44,000	.0829	....	
1,299	46,000	.0867	....	
1,356	48,000	.0908	....	
1,412	50,000	.0945	.0027	E = 32,000,000 between 10,000 and 50,000 pounds.
1,468	52,000	.0984	....	
1,525	54,000	.1038	....	
1,581	56,000	.1080	....	
1,638	58,000	.1131	....	
1,694	60,000	.1190	.0075	
1,751	62,000	.1270	....	
1,807	64,000	.1340	....	
1,864	66,000	.1468	....	
1,920	68,000	.1662	....	
1,977	70,000	.1918	.0547	
2,033	72,000	.2201	....	
2,090	74,000	.2497	....	
2,146	76,000	.2850	....	
2,203	78,000	.3314	....	
2,259	80,000	.3740	....	
2,316	82,000	.40	....	
2,372	84,000	.45	....	
2,429	86,000	.51	....	
2,485	88,000	.55	....	
2,542	90,000	.61	....	
2,598	92,000	.68	....	
2,654	94,000	.75	....	

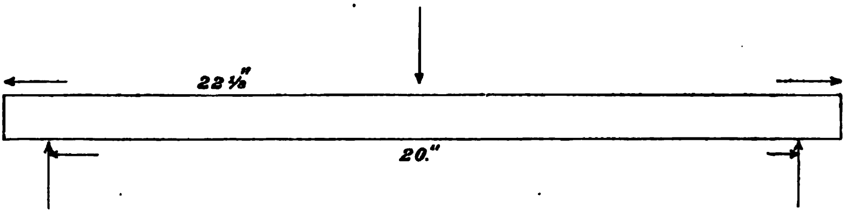
Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
2, 711	96, 000	.78	....	
2, 768	98, 000	.84	....	
2. 824	100, 000	.91	....	
2, 860	102, 000	.97	....	
2, 937	104, 000	1. 04	....	
2, 993	106, 000	1. 11	....	
3, 050	108, 000	1. 20	....	
3, 106	110, 000	1. 29	....	
3. 163	112, 000	1. 37	....	
3, 219	114, 000	1. 46	....	
3. 276	116, 000	1. 55	....	
3, 332	118, 000	1. 64	....	
3, 389	120, 000	1. 73	....	
3, 445	122, 000	1. 83	....	
3, 502	124, 000	1. 98	....	
3, 558	126, 000	2. 11	....	
3, 615	128, 000	2. 33	....	
3. 671	130, 000	2. 46	....	
3, 728	132, 000	2. 60	....	
3, 784	134, 000	2. 88	....	
3. 841	136, 000	3. 30	....	
3, 860	136, 680	4. 00	....	Specimen drew off the end bearings.

The metal on the tension side opposite the middle bearing showed incipient fractures.

Permanent deflection, 4″.20.

No. 4.

Transverse Test.



Mark on bar, 24.
Diameter, 1″.129.
Loaded at the middle.
End supports 20″ apart.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
0.	0.	0.	0.	
56	2, 000	.0040	....	
113	4, 000	.0081	....	
169	6, 000	.0120	....	
226	8, 000	.0160	....	
282	10, 000	.0194	.0002	
339	12, 000	.0240	....	
395	14, 000	.0273	....	
452	16, 000	.0310	....	
508	18, 000	.0349	....	

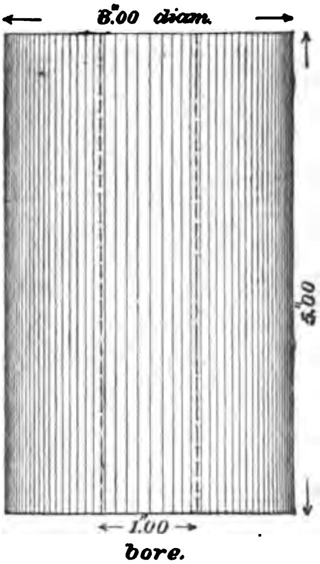
Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
565	20,000	.0389	.0003	
621	22,000	.0430	....	
678	24,000	.0468	....	
734	26,000	.0510	....	
791	28,000	.0545	....	
847	30,000	.0578	.0009	
904	32,000	.0617	....	
960	34,000	.0651	....	
1,017	36,000	.0688	....	
1,073	38,000	.0723	....	
1,130	40,000	.0765	.0011	
1,186	42,000	.0811	....	
1,243	44,000	.0851	....	
1,299	46,000	.0888	....	
1,356	48,000	.0929	....	
1,412	50,000	.0968	.0024	E = 31,400,000 pounds between 10,000 and 50,000 pounds.
1,468	52,000	.1010	....	
1,525	54,000	.1052	....	
1,581	56,000	.1093	....	
1,638	58,000	.1142	....	
1,694	60,000	.1198	.0060	
1,751	62,000	.1260	....	
1,807	64,000	.1325	....	
1,864	66,000	.1436	....	
1,920	68,000	.1580	....	
1,977	70,000	.1857	.0470	
2,033	72,000	.2198	....	
2,090	74,000	.2539	....	
2,146	76,000	.3000	....	
2,203	78,000	.3506	....	
2,259	80,000	.3942	....	
2,316	82,000	.45	....	
2,372	84,000	.50	....	
2,429	86,000	.55	....	
2,485	88,000	.60	....	
2,542	90,000	.67	....	
2,598	92,000	.73	....	
2,654	94,000	.79	....	
2,711	96,000	.85	....	
2,768	98,000	.94	....	
2,824	100,000	1.00	....	
2,880	102,000	1.08	....	
2,937	104,000	1.15	....	
2,993	106,000	1.24	....	
3,050	108,000	1.33	....	
3,106	110,000	1.41	....	
3,163	112,000	1.51	....	
3,219	114,000	1.60	....	
3,276	116,000	1.75	....	
3,332	118,000	1.83	....	
3,389	120,000	1.98	....	
3,445	122,000	2.15	....	
3,502	124,000	2.30	....	
3,558	126,000	2.51	....	
3,615	128,000	2.78	....	
3,671	130,000	3.07	....	
3,728	132,000	3.37	....	Maximum load reached.

When the deflection reached 5.06, the specimen drew off the end bearings.

No indications of rupture of the metal.

Permanent deflection, 4″.46.

Bursting Test.



Mark on cylinder, 25.

Cylinder and reservoir charged with water.

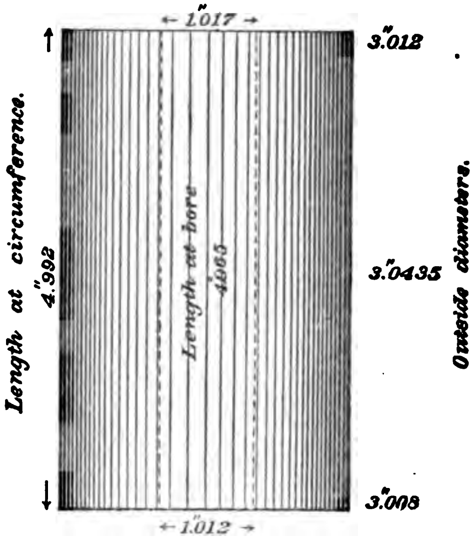
Length of bore of cylinder exposed to internal pressure, including copper and leather checks and packings, 4".55.

Applied loads on piston of reservoir.		Enlargement of middle diameter of cylinder.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
1,075	1,000	0.	Initial load.
32,250	30,000	....	
1,075	1,000	0.	
53,750	50,000	....	
1,075	1,000	.0014	
93,000	86,512	....	Maximum load reached.
1,075	1,000	.0435	

While loads were applied, the cylinder was covered with canvas, which was removed after each loading to admit of measuring the distortion in diameter while under the initial load.

After the enlargement caused by 86,512 pounds per square inch had been determined, the cylinder was subjected to a pressure of 30,000 pounds per square inch uncovered. There was no evidence of porosity under this pressure.

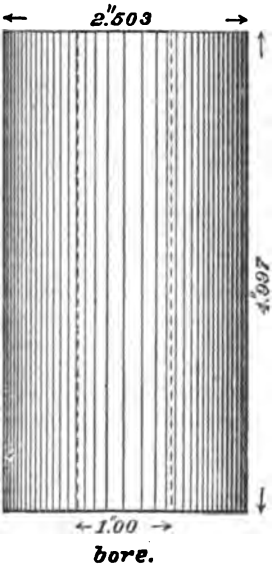
Dimensions of cylinder after having been loaded with 86,512 pounds per square inch, internal pressure:



A crack ¼″ long was developed in the bore, 1″.8 from the end of the cylinder.

Four spongy spots of metal at one end of the cylinder, varying in diameter from $\frac{1}{16}$″ to ¼″.

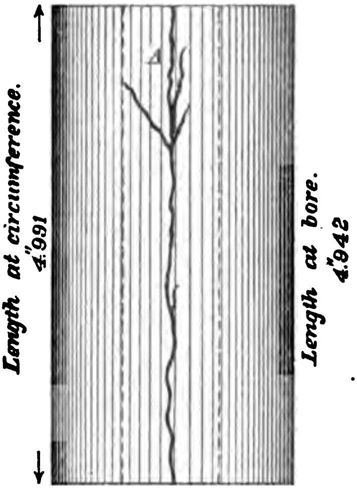
Bursting Test.



Mark on cylinder, 26.

Cylinder and resorvoir charged with water.

Applied loads on piston of reservoir.		Enlargement of middle diameter of cylinder	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
1,075	1,000	0.	Initial load.
10,750	10,000	.002	
21,500	20,000	.004	
82,250	30,000	.0045	
1,075	1,000	0.	
87,625	35,000	....	
1,075	1,000	.00	
43,000	40,000	....	
1,075	1,000	....	
48,375	45,000	....	
1,075	1,000	.0045	
53,750	50,000	....	
1,075	1,000	.009	
59,125	55,000	....	
1,075	1,000	.016	
64,500	60,000	....	
1,075	1,000	.023	
78,200	72,744	....	Bursting pressure.



The cylinder burst into two pieces. The lines of fracture were nearly parallel to the axis of the cylinder, and separated it into parts which weighed 3 pounds 3 ounces, and 2 pounds 10½ ounces, respectively.

The line of fracture on one side, A, as shown by the sketch, was irregular, tending to branch out at one end. The fractured surface was granular, and flaky, radiating from the center.

Two small blow-holes are in the plane of fracture; one is ½″ from the middle of the bore, and one ¾″ from the middle of the length of the cylinder at the circumference. It is thought this side was the first to fracture.

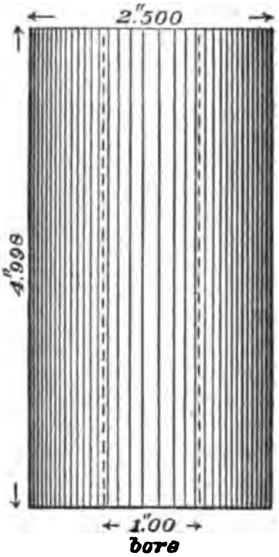
The fracture of the opposite side was more direct from end to end. Its appearance was granular, radiating from a point at the bore midway its length.

The walls of the cylinder were reduced in thickness ″.05 at the middle.

Maximum diameter of bore, 1″.15.

The copper check at lower end of cylinder was expanded to 1″.04 diameter; at the upper end the ckeck was expanded to 1″.03 diameter.

Bursting Test.



Mark on cylinder, 27.

Cylinder and reservoir charged with distilled water.

Five spots of spongy metal were observed in finishing this cylinder. All turned out except one. Maximum size of spots ".20 × ".20.

Applied loads on piston of reservoir.		Enlargement of middle diameter of cylinder.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
1,075	1,000	0.	Initial load.
10,750	10,000	0.	
21,500	20,000	.0005	
32,250	31,000	.0005	
37,625	35,000	....	
1,075	1,000	.001	
43,000	40,000	....	
1,075	1,000	.002	
48,375	45,000	....	
1,075	1,000	.005	
53,750	50,000	....	
1,075	1,000	.009	
59,125	55,000	....	
1,075	1,000	.013	
64,500	60,000	....	
1,075	1,000	.019	
77,500	72,093	....	Bursting pressure.

The cylinder burst into two pieces. The lines of fracture were nearly parallel to the axis of the cylinder, and separated it into parts weighing 3 pounds 6¼ ounces, and 2 pounds 7 ounces, respectively.

The fractures were granular, radiating from points along the bore on one fractured surface. It is thought fracture occurred first in this surface.

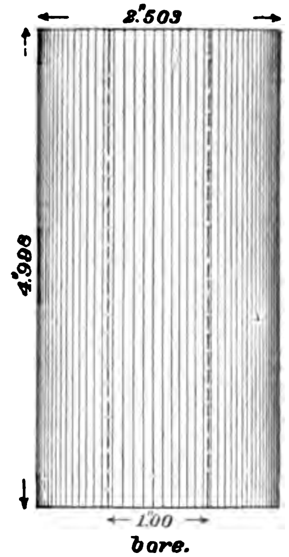
The opposite fractured surface had two distinct centers of radiation, situated 1″ and 1½″, respectively, from the ends of the cylinder.

In the large fragment a longitudinal seam was opened, extending from one end along the bore a distance of 2½″ and ″.55 deep.

The copper check at the lower end was enlarged to 1″.02 diameter. At the upper end the check was enlarged to 1″.03 diameter.

Minimum thickness of walls ″.71.

Bursting Test.



Mark on cylinder, 28.

Cylinder and reservoir charged with distilled water.

Applied loads on piston of reservoir.		Enlargement of middle diameter of cylinder.	Remarks.
Total.	Per square inch.		
Pounds.	*Pounds.*	*Inch.*	
1,075	1,000	0.	Initial load.
10,750	10,000	.0005	
21,500	20,000	.0005	
32,250	30,000	.0005	
37,625	35,000	.0005	
1,075	1,000	0.	
43,000	40,000	....	
1,075	1,000	.0005	
48,375	45,000	....	
1,075	1,000	.0015	
53,750	50,000	....	
1,075	1,000	.0065	
59,125	55,000	....	
1,075	1,000	.0095	
64,500	60,000	....	
1,075	1,000	.0145	
80,500	74,884	....	Maximum load reached.
0	0	.0125	

TABULATION OF RESULTS OF TESTS OF SPECIMENS TAKEN FROM CAST STEEL—Continued.

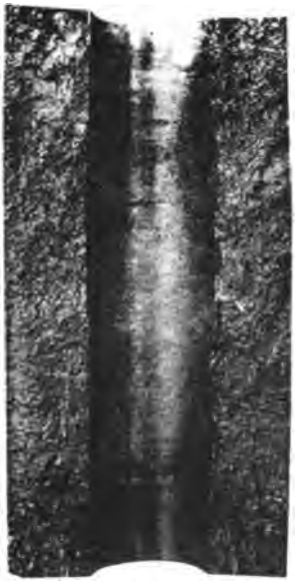
TRANSVERSE TESTS.

Number of test.	Number on bar.	Position in cylinder.	Diameter.	Length between end supports.	Modulus of rupture.	Modulus of elasticity.	Appearance of fracture.
			Inches.	*Inches.*			
3	23	Longitudinal outside	1.129	20	136,680	82,600,000	Drew off the end bearings.
4	24	Longitudinal inside	1.129	20	132,000	81,400,000	Do.

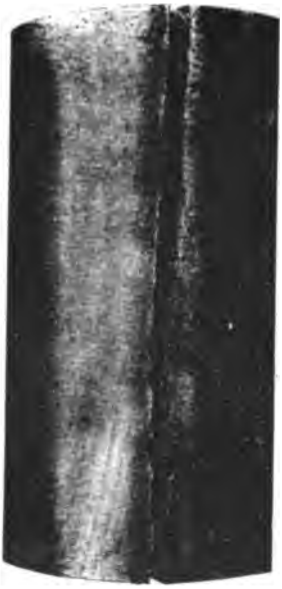
BURSTING TESTS.

Number of test.	Number on bar.	Position in cylinder.	Dimensions of cylinder.			Length of bore exposed to pressure.	Bursting pressure per square inch.	Description of fracture.
			Length.	Outside diameter.	Diameter of bore.			
			Inches.	*Inches.*	*Inches.*	*Inches.*	*Pounds.*	
.....	25	Radial	5.00	3.00	1.00	4.55	86,512	Crack developed in the bore ¼" long.
.....	26	......do	4.997	2.503	1.00	4.55	72,744	Cylinder burst into two pieces.
.....	27	Longitudinal outside	4.998	2.500	1.00	4.55	72,093	Do.
.....	28	Longitudinal inside	4.998	2.503	1.00	4.55	74,884	Four lines of rupture in the surface of the bore.

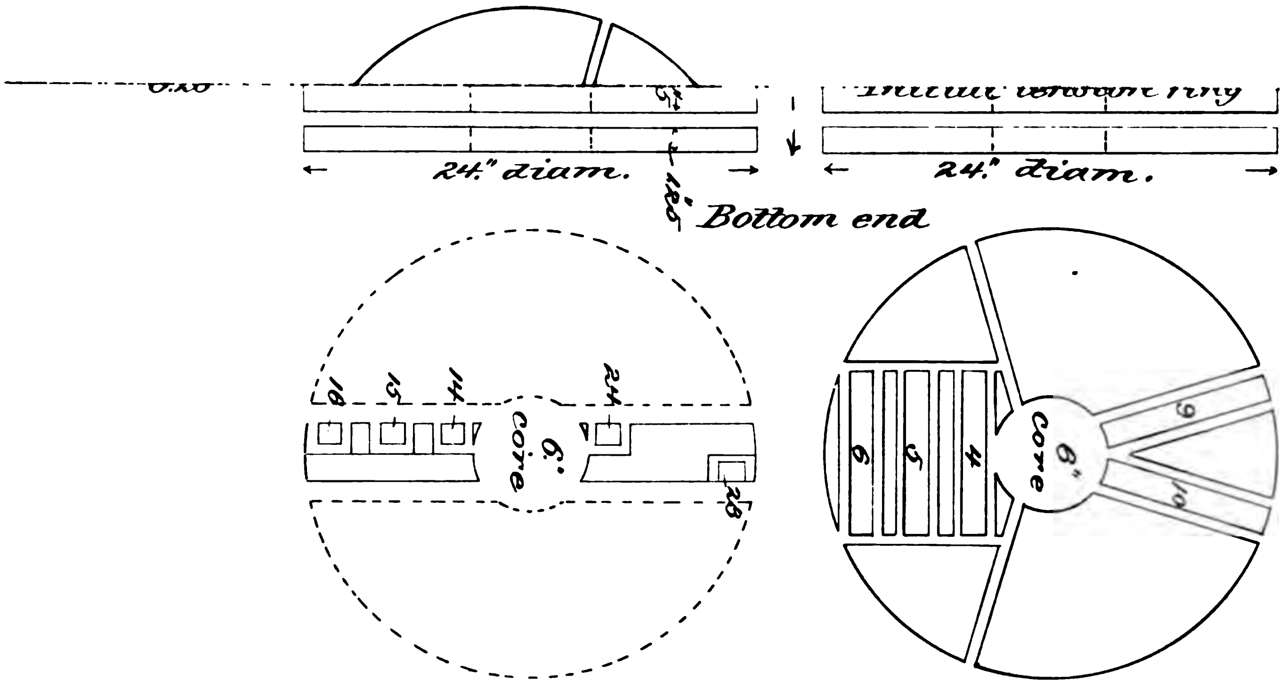
PHOTOGRAPH OF FRACTURED CYLINDERS.



No. 26.



No. 27.


24" diam.
24" diam.
.5
1.25"
Bottom end
6" core
6" core
4
5
6
9
10
14
15
16
24
28

18.—8" INCH SHOT.

CAST IRON FROM WATERTOWN ARSENAL FOUNDRY.

[Elongation of bars Nos. 444, 445, and 446, measured with triple micrometer.]

No. 444.

Marks on bar, 7
Diameter, ".564.
Sectional area, .25 square inch.

SECTION A.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000100	.000100	....	....	
750	3,000	.000133	.000033	....	....	
1,000	4,000	.000233	.000100	....	....	
1,250	5,000	.000333	.000100	0.	....	
1,500	6,000	.000433	.000100	....	....	
1,750	7,000	.000500	.000067	....	....	
2,000	8,000	.000567	.000067	0.	....	
2,250	9,000	.000633	.000066	....	....	
2,500	10,000	.000767	.000134	.000033	.000033	
2,750	11,000	.000833	.000066	....	....	
3,000	12,000	.000967	.000134	.000067	.000034	
3,250	13,000	.001033	.000066	....	....	
3,500	14,000	.001167	.000134	....	....	
3,750	15,000	.001267	.000100	.000100	.000033	
4,000	16,000	.001400	.000133	....	....	
4,250	17,000	.001533	.000133	....	....	
4,500	18,000	.001700	.000167	.000233	.000133	
4,750	19,000	.001900	.000200	....	....	
5,000	20,000	.002233	.000333	.000533	.000300	
5,280	21,120	....	....	....	....	Tensile strength.

SECTION B.

250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000100	.000100	....	....	
750	3,000	.000100	0.	....	....	
1,000	4,000	.000233	.000133	....	....	
1,250	5,000	.000300	.000067	.000067	.000067	
1,500	6,000	.000433	.000133	....	....	
1,750	7,000	.000533	.000133	....	....	
2,000	8,000	.000600	.000067	.000067	0.	
2,250	9,000	.000667	.000067	....	....	
2,500	10,000	.000833	.000166	.000100	.000033	
2,750	11,000	.000867	.000034	....	....	
3,000	12,000	.000967	.000100	.000133	.000033	
3,250	13,000	.001067	.000100	....	....	
3,500	14,000	.001233	.000166	....	....	
3,750	15,000	.001333	.000100	.000200	.000067	
4,000	16,000	.001433	.000100	....	....	
4,250	17,000	.001600	.000167	....	....	
4,500	18,000	.001767	.000167	.000300	.000100	
4,750	19,000	.002033	.000266	....	....	
5,000	20,000	.002400	.000367	.000600	.000300	
5,280	21,120	....	....	....	....	Tensile strength.

SECTION C.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033	....	....	
750	3,000	.000067	.000034	....	....	
1,000	4,000	.000100	.000033	....	....	
1,250	5,000	.000167	.000067	—.000033	—.000033	
1,500	6,000	.000233	.000066	....	....	
1,750	7,000	.000333	.000100	....	....	
2,000	8,000	.000367	.000034	—.000100	—.000067	
2,250	9,000	.000367	0.	....	....	
2,500	10,000	.000467	.000100	—.000100	0.	
2,750	11,000	.000567	.000100	....	....	
3,000	12,000	.000600	.000033	—.000100	0.	
3,250	13,000	.000700	.000100	....	....	
3,500	14,000	.000767	.000067	....	....	
3,750	15,000	.000900	.000133	—.000033	—.000067	
4,000	16,000	.001067	.000167	....	....	
4,250	17,000	.001200	.000133	....	....	
4,500	18,000	.001300	.000100	000067	.000100	
4,750	19,000	.001433	.000133	....	....	
5,000	20,000	.001767	.000334	.000233	.000166	
5,280	21,120	....	....	....	....	Tensile strength.

Specific gravity, 7.2306.
Fractured at neck. Appearance, gray mottled.

No. 445.

Mark on bar, 8
Diameter, ″.564.
Sectional area, .25 square inch.

SECTION A.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000233	.000233	....	....	
750	3,000	.000400	.000167	....	....	
1,000	4,000	.000533	.000133	....	....	
1,250	5,000	.000633	.000100	.000233	.000233	
1,500	6,000	.000733	.000100	....	....	
1,750	7,000	.000833	.000100	....	....	
2,000	8,000	.000933	.000100	.000300	.000067	
2,250	9,000	.001000	.000067	....	....	
2,500	10,000	.001133	.000133	.000333	.000033	
2,750	11,000	.001200	.000067	....	....	
3,000	12,000	.001333	.000133	.000400	.000067	
3,250	13,000	.001433	.000100	....	....	
3,500	14,000	.001567	.000134	....	....	
3,750	15,000	.001667	.000100	.000500	.000100	
4,000	16,000	.001833	.000166	....	....	
4,250	17,000	.001967	.000134	....	....	
4,420	17,680	....	....	....	....	Tensile strength.

SECTION B.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033			
750	3,000	.000067	.000034			
1,000	4,000	.000100	.000033			
1,250	5.000	.000200	.000100	—.000100	—.000100	
1,500	6,000	.000233	.000033			
1,750	7,000	.000333	.000100			
2,000	8,000	.000433	.000100	—.000100	0.	
2,250	9,000	.000500	.000067			
2,500	10,000	.000633	.000133	—.000100	0.	
2,750	11,000	.000733	.000100			
3,000	12.000	.000867	.000134	—.000067	.000033	
3,250	13,000	.000967	.000100			
3,500	14,000	.001133	.000166			
3,750	15,000	.001200	.000067	—.000033	.000034	
4,000	16,000	.001333	.000133			
4,250	17,000	.001567	.000234			
4,420	17,680					Tensile strength.

SECTION C.

250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000033	.000033			
750	3,000	.000067	.000034			
1,000	4,000	.000067	0.			
1,250	5,000	.000167	.000100	—.000133	—.000133	
1,500	6,000	.000200	.000033			
1,750	7,000	.000300	.000100			
2,000	8,000	.000400	.000100	—.000133	0.	
2,250	9,000	.000467	.000067			
2,500	10,000	.000567	.000100	—.000100	.000033	
2,750	11,000	.000667	.000100			
3,000	12,000	.000833	.000166	—.000100	0.	
3,250	13,000	.000867	.000034			
3,500	14,000	.001000	.000133			
3,750	15,000	.001100	.000100	.000000	.000100	
4,000	16,000	.001233	.000133			
4,250	17,000	.001400	.000167			
4,420	17,680					Tensile strength.

Specific gravity 7.2063
Specific gravity of slice outside 7.2379
Fractured at neck.
Appearance gray mottled.

No. 446.

Mark on bar, 6
Diameter, ″.564.
Sectional area, .25 square inch.

SECTION A.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000067	.000067	....	....	
750	3,000	.000100	.000033	....	....	
1,000	4,000	.000133	.000033	....	....	
1,250	5,000	.000167	.000034	0.	....	
1,500	6,000	.000200	.000033	....	....	
1,750	7,000	.000267	.000067	....	....	
2,000	8,000	.000333	.000066	—.000067	—.000067	
2,250	9,000	.000367	.000034	....	....	
2,500	10,000	.000433	.000066	....	....	
2,750	11,000	.000500	.000067	—.000067	0.	
3,000	12,000	.000567	.000067	....	....	
3,250	13,000	.000633	.000066	—.000067	0.	
3,500	14,000	.000733	.000100	....	....	
3,750	15,000	.000833	.000100	—.000067	0.	
4,000	16,000	.000900	.000067	....	....	
4,250	17,000	.001033	.000133	....	....	
4,500	18,000	.001133	.000100	....	....	
4,750	19,000	.001233	.000100	....	....	
5,000	20,000	.001367	.000134	.000033	.000100	
6,290	25,160	....	....	....	....	Ultimate strength.

SECTION B.

250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000067	.000067	....	....	
750	3,000	.000100	.000033	....	....	
1,000	4,000	.000167	.000067	....	....	
1,250	5,000	.000267	.000100	0.	....	
1,500	6,000	.000333	.000066	....	....	
1,750	7,000	.000367	.000034	....	....	
2,000	8,000	.000467	.000100	0.	....	
2,250	9,000	.000533	.000066	....	....	
2,500	10,000	.000600	.000067	—.000033	—.000033	
2,750	11,000	.000667	.000067	....	....	
3,000	12,000	.000733	.000066	—.000033	0.	
3,250	13,000	.000800	.000067	....	....	
3,500	14,000	.000867	.000067	....	....	
3,750	15,000	.000933	.000066	0.	.000033	
4,000	16,000	.001033	.000100	....	....	
4,250	17,000	.001133	.000100	....	....	
4,500	18,000	.001233	.000100	....	....	
4,750	19,000	.001367	.000134	....	....	
5,000	20,000	.001500	.000133	.000133	.000133	
6,290	25,160	....	....	....	....	Ultimate strength.

SECTION C.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
500	2,000	.000167	.000167	....	....	
750	3,000	.000233	.000066	....	....	
1,000	4,000	.000367	.000134	....	....	
1,250	5,000	.000500	.000133	.000167	.000167	
1,500	6,000	.000600	.000100	....	....	
1,750	7,000	.000667	.000067	....	....	
2,000	8,000	.000733	.000066	.000233	.000066	
2,250	9,000	.000833	.000100	....	....	
2,500	10,000	.000967	.000134	.000267	.000034	
2,750	11,000	.001067	.000100	....	....	
3,000	12,000	.001133	.000066	.000333	.000066	
3,250	13,000	.001267	.000134	....	....	
3,500	14,000	.001367	.000100	....	....	
3,750	15,000	.001433	.000066	.000400	.000067	
4,000	16,000	.001600	.000167	....	....	
4,250	17,000	.001733	.000133	....	....	
4,500	18,000	.001833	.000100	....	....	
4,750	19,000	.002000	.000167	....	....	
5,000	20,000	.002167	.000167	.000600	.000200	
6,290	25,160	....	....	....	....	Ultimate strength.

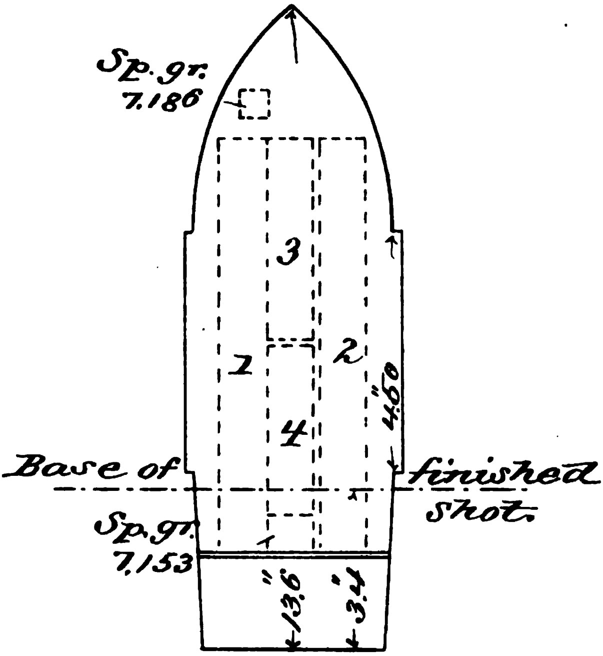
Specific gravity	7.2437
Specific gravity of slice inside	7.1751

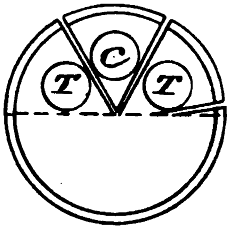
Fractured 1½″ from neck.
Appearance gray, mottled.

Cast iron from 3″.2 shell.

No. of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inches.	*Sq. inch.*	*Pounds.*	*Pounds.*	
	1	.564	.25	5,400	21,600	
	2	.564	.25	5,600	22,400	

4.2" Shot





Cast iron from 4″.2 shot.

No. of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inch.	*Sq. inch.*	*Pounds.*	*Pounds.*	
	1	.564	.25	6,000	24,000	
	2	.564	.25	6,200	24,800	

Compression of cast iron from 3″.2 shell and 4″.2 shot.

Marks.	Length.	Diameter.	Sectional area.	Ultimate strength.		
				Total.	Per square inch.	
	Inches.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	
3	4.992	.798	.50	36,200	72,400	From 3″.2 shell.
3	5.000	.799	.50	41,700	83,400	From 4″.2 shot.
4	3.000	.800	.50	47,000	94,000	From 4″.2 shot.

Cast iron from 3″.2 shell.

No. of test.	Numbers.	Diameter.	Sectional area.	Tensile strength.		Appearance of fracture.
				Total.	Per square inch.	
		Inch.	*Sq. inch.*	*Pounds.*	*Pounds.*	
771	1	.505	.20	5,280	26,400	Fine granular.
772	2	.505	.20	5,660	28,300	Fine granular.
773	3	.505	.20	5,524	27,620	Fine granular.
774	4	.505	.20	5,472	27,360	Fine granular.

Cast iron from 8″ shot.

No. of test.	Length cylindrical.	Diameter.	Sectional area.	Ultimate strength.		Appearance of fracture.
				Total.	Per square inch.	
	Inch.	*Inch.*	*Sq. inch.*	*Pounds.*	*Pounds.*	
1	Grooved.	.564	.25	4,694	18,776	Gray mottled.
2	1	.564	.25	5,015	20,060	Gray mottled.
3	2	.564	.25	5,270	21,080	Gray mottled.
4	2	.564	.25	5,288	21,152	Gray mottled.
5	2	.564	.25	4,452	17,808	Gray mottled.

Cast iron.

When cast.	Dimensions.		Sectional area.	Ultimate strength.		Appearance of fractures.
	Width.	Thickness.		Total.	Per square inch.	
	Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	
May 27, 1885	2.18	1.09	2.38	47,600	20,000	Fine granular. Small spots of defective metal in each bar.
	2.15	1.09	2.34	44,850	19,167	
	2.16	1.12	2.42	51,840	21,421	
May 28, 1885	.504	diameter	.20	3,960	19,800	Fine granular.
	.504	diameter	.20	3,890	19,450	
	.504	diameter	.20	3,960	19,800	
From 3.2 shell cast May 21, 1885	.504	diameter	.20	6,148	30,740	Light gray granular.
	.504	diameter	.20	5,930	29,650	
	.504	diameter	.20	6,210	31,050	

19.—TENSILE TESTS OF RIVETED JOINTS.

Earlier experiments on this subject made with single and double riveted lap and butt joints in different thicknesses of iron and steel plate, together with the tests of specimens prepared to illustrate the strength of constituent parts of joints, are recorded in the report of tests for 1882 and 1883.

From the results thus obtained it appeared desirable to institute a synthetical series of tests, beginning with the most elementary forms of joints in which the stresses are found in their least complicated state. To meet these conditions, a series of joints have been prepared which may be designated as single riveted butt joints, in which the covers are extended so as to be grasped in the testing machine; thereby enabling one plate of the joint to be dispensed with, and securing the test of one line of riveting.

Such a joint, made with carefully annealed mild steel plate of superior quality, with drilled holes, seems well adapted to demonstrate the influence on the tensile strength of the metal taken across the line of riveting, of variations in the width of the net section between rivets, and variations in the compression stress on the bearing surface of the rivets; elements which are believed to be fundamental in all riveted construction.

This series comprises 216 specimen joints, the thickness of the plate ranging from $\frac{1}{4}''$ to $\frac{3}{4}''$, advancing by eighths. The covers are from $\frac{3}{16}''$ to $\frac{7}{16}''$.

The rivets are wrought-iron, and range from $\frac{9}{16}''$ to $1\frac{3}{16}''$ diameter; they are machine driven in drilled holes $\frac{1}{16}''$ larger in diameter than the nominal size of the rivets.

Tensile tests of the material accompany the tests of the joints.

From each sheet of steel two test strips were sheared, one lengthwise and one crosswise. The strips were $2\frac{1}{2}''$ wide and 24″ to 36″ long; they were annealed with the specimen plates, and had their edges planed, reducing their widths to $1\frac{1}{2}''$ before testing.

Micrometer readings were taken in 10″ along the middle of the length of each.

The strength and ductility appears to be substantially the same in each direction. But the practice of the rolling-mill where these sheets were rolled is such that nearly the same amount of work may have been given the steel in each direction: that is, lengthwise and crosswise the finished sheet.

The ingots of open hearth metal are first rolled down to slabs about 6″ thick, then reheated and rolled either lengthwise or crosswise their former direction, as best suits the required finished dimensions.

The tensile tests show among the thinner plates a relatively high elastic limit as compared with the tensile strength; in the $\frac{3}{16}''$ plate, the percentage is 72.2, while with the $\frac{3}{4}''$ plate the percentage is found to be 53.3.

It is noticeable that the thinner plates particularly exhibit a large stretch immediately following the elastic limit, and the stretching is continued at times under a load lower than that which had been previously sustained. It is characteristic of all the thicknesses that a considerable stretch takes place under loads approaching the tensile strength—in some cases the stretch increases 5 to 6 per cent. while the stress advances 1,000 pounds per square inch or less.

Herein is found a valuable property of this metal as a material for riveted construction. The stress from the bearing surface of the rivets, is distributed over the net section of plate between the rivets, due to the large stretch of the metal, with little elevation of the stress, and a nearer approximation of uniform stress in this section attained than is found in a brittle or less ductile metal.

The joints were held for testing in the hydraulic jaws of the testing machine, having 24″ exposure between them. A loose piece of steel the same thickness as the plate was placed between the covers to receive the grip of the jaws, and avoid bending the covers.

Elongations were measured in a gauged lenth of 5″, the micrometer covering the joint at the middle of its width. Loads were applied in increments of 1,000 pounds per square inch of the gross section of the plate; the effect of each increment determined by the micrometer, and permanent sets observed at intervals.

The progress of the test of a joint is generally marked by three well defined periods. In the first period greatest rigidity is found, and it is thought that the joint is now held entirely by the friction of the rivet heads, and the movement of the joint is principally that due to the elasticity of the metal.

The second period is distinguished by a rapid increase in the stretch of the joint; attributed to the overcoming of the friction under the rivet heads and closing up any clearance about the rivets, bringing them into bearing condition against the fronts of the rivet holes. Rivets which are said to fill the holes, can hardly do so completely, on account of the contraction of the metal of the rivet from a higher temperature than that of the plate, after the rivet is driven.

After a brief interval, the movement of the joint is retarded, and the third period is reached. The stretch of the joint is now believed to be due to the distortion of the rivet holes and the rivets themselves.

The movement begins slowly, and so continues till the elastic limit of the metal about the rivet holes is passed, and general flow takes place over the entire cross-section, and rupture is reached.

These stages in the test of a joint are well defined except when the plates are in a warped condition initially, when abnormal micrometer readings are observed.

The difference in behavior of a joint and the solid metal suggests the propriety of arranging tension joints in boiler construction and elsewhere as nearly in line as practicable.

The efficiencies of the joints are computed on the basis of the tensile strength of the lengthwise strips, this being the direction in which the metal of the joints is strained. The efficiencies here found are undoubtedly lowered somewhat by the contraction in width of the specimens, causing in most cases fractures to begin at the edges and extend towards the middle of the joint.

Of the entire series, 88 joints have been tested; the ½″, ⅝″, and ¾″ plates yet remain.

DETAILS OF TENSION TESTS OF O. H. STEEL EMPLOYED IN CONSTRUCTION OF RIVETED JOINTS.

No. 1,200.

$\frac{3}{16}''$ plate.
Marks, A lengthwise.
Sectional area, 1″.497×″.184 = .275 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
275	1, 000	0.	0.	Initial load.
1, 375	5, 000	.0028	....	
2, 750	10, 000	.0052	0.	
4, 125	15, 000	.0074	....	
5, 500	20, 000	.0094	0.	
6, 875	25, 000	.0112	....	
8, 250	30, 000	.0132	.0002	
11, 000	....	.0172	....	
11, 200	....	.0175	....	
11, 400	....	.0180	....	
11, 600	42, 180	.0183	....	Elastic limit.
11. 800	....	.0188	....	
12, 000	....	.0196	....	
12, 200	....	.0205	....	
12, 400	....	.0216	....	
12, 600	....	.0237	....	
12, 800	....	.0365	....	
13, 000	....	.0635	....	
12, 600	....	.1032	....	
12, 800	....	.1245	....	
18, 000	....	.1520	....	
13, 200	....	.1900	....	
13, 400	....	.2460	....	
18, 600	....	.270	....	
13, 800	....	.305	....	
14, 000	....	.325	....	
14, 200	....	.350	....	
14, 400	....	.367	....	
14, 600	....	.395	....	
14, 800	....	.440	....	
15, 000	....	.48	....	
15, 200	....	.50	....	
15, 400	....	.54	....	
15, 600	....	.56	....	
15, 800	....	.60	....	
16, 000	....	.65	....	
16, 200	....	.70	....	
16, 400	....	.78	....	
16, 600	....	.83	....	
16, 500	....	.95	....	
17, 000	....	1.05	....	
17, 200	....	1.20	....	
17. 340	63, 050	1.44	....	Tensile strength.
15, 100	....	....	....	Load at time of fracture.

Elongation after fracture, 1″.67=16.7 per cent.

Elongation of inch sections, ″.50*, ″.19, ″.11, ″.09, ″.12, ″.13, ″.12, ″.13, ″.14, ″.14.

Area at fracture, 1″.21×″.11 = .133 square inch.

Contraction, 51.6 per cent.

Appearance of fracture fine, silky, slight lamination.

No. 1201.

$\frac{3}{16}$″ plate.
Marks, B lengthwise.
Sectional area, 1″.497×″.183=.274 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
274	1,000	0.	0.	Initial load.
1,370	5,000	.0021	....	
2,740	10,000	.0040	0.	
4,110	15,000	.0059	....	
5,480	20,000	.0077	0.	
6,850	25,000	.0094	....	
8,220	30,000	.0113	0.	
9,590	35,000	.0130	....	
10,960	40,000	.0151	.0003	
11,200	....	.0153	....	
11,400	....	.0157	....	
11,600	....	.0160	....	
11,800	43,070	.0163	....	Elastic limit.
12,000	....	.0172 .0200	....	
11,400	....	.0238	....	
11,600	....	.0257	....	
11,800	....	.0296	....	
12,000	....	.0460	....	
12,200	....	.1000	....	
12,400	....	.2035	....	
12,600	....	.2300	....	
12,800	....	.2650	....	
13,000	....	.3300	....	
13,200	....	.3520	....	
13,400	....	.3650	....	
13,600	....	.3970	....	
13,800	....	.43	....	
14,000	....	.48	....	
14,200	....	.51	....	
14,400	....	.54	....	
14,600	....	.57	....	
14,800	....	.61	....	
15,000	....	.66	....	
15,200	....	.73	....	
15,400	....	.80	....	
15,600	....	.91	....	
15,800	....	.98	....	
16,000	....	1.13	....	
16,180	59,160	1.47	....	Tensile strength.
13,800	....	....	....	Load at time of fracture.

Elongation after fracture, 1″.87=18.7 per cent.

Elongation of inch sections, ″.17, ″.31, ″.55*, ″.17, ″.14, ″.13, ″.11, ″.09, ″.09, ″.11.

Area at fracture, 1″.27×″.10=.127 square inch.

Contraction, 53.7 per cent.

Appearance of fracture silky, lamellar.

No. 1202.

$\frac{3}{16}''$ plate.
Marks, C lengthwise.
Sectional area, 1″.498×″.193=.289 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
289	1,000	0.	0.	Initial load.
1,445	5,000	.0022		
2,890	10,000	.0045	0.	
4,835	15,000	.0065		
5,780	20,000	.0082	0.	
7,225	25,000	.0100		
8,670	30,000	.0119	0.	
10,115	35,000	.0137		
11,560	40,000	.0157	.0001	
11,800		.0159		
12,000		.0161		
12,200		.0164		
12,400		.0167		
12,600	43,600	.0169		Elastic limit.
12,800		.0173 .0200		
13,000		.0233		
13,200		.0300		
13,000		.0563		
13,200		.0835 .1250		
13,000		.1500		
13,200		.2050		
13,400		.2975		
13,600		.3120		
13,800		.3200		
14,000		.340		
14,200		.355		
14,400		.380		
14,600		.405		
14,800		.45		
15,000		.48		
15,200		.51		
15,400		.55		
15,600		.57		
15,800		.61		
16,000		.65		
16,200		.70		
16,400		.75		
16,600		.83		
16,800		.93		
17,000		.98		
17,200		1.10		
17,400		1.23		
17,600		1.40		
17,710	61 280	1.70		Tensile strength.
15,300				Load at time of rupture.

Elongation after rupture, 2″.09=20.9 per cent.

Elongation of inch sections ″.24, ″.56*, ″.26, ″.18, ″.15, ″.13, ″.15, ″.13, ″.16, ″.13.

Area at fracture, 1″.21×″.12 = .145 square inch.

Contraction, 49.8 per cent.

Appearance of fracture silky, lamellar.

No. 1203.

$\frac{3}{16}$″ plate.
Marks, D lengthwise.
Sectional area, 1″.499 × ″.186 = .279 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
279	1,000	0.	0.	Initial load.
1,395	5,000	.0014	....	
2,790	10,000	.0035	−.0001	
4,185	15,000	.0056	....	
5,580	20,000	.0074	−.0001	
6,975	25,000	.0088	....	
8,370	30,000	.0106	−.0001	
9,765	35,000	.0123	....	
11,160	40,000	.0141	−.0001	
11,400	....	.0144	....	
11,600	....	.0147	....	
11,800	....	.0149	....	
12,000	....	.0151	....	
12,200	....	.0153	....	
12,400	....	.0156	....	
12,600	....	.0158	....	
12,800	....	.0161	....	
13,000	....	.0163	....	
13,200	....	.0167	....	
13,400	48,030	.0169	....	Elastic limit.
13,600	....	.0182	....	
13,800	....	.0230	....	
13,200	....	.0343	....	
13,400	....	.0385 .0650	....	
13,600	....	.1200	....	
13,800	....	.2300	....	
14,000	....	.3260	....	
14,200	....	.3295	....	
14,400	....	.3340	....	
14,600	....	.364	....	
14,800	....	.378	....	
15,066	54,000	.411	....	
15,345	55,000	.45	....	
15,624	56,000	.53	....	
15,903	57,000	.59	....	
16,182	58,000	.63	....	
16,461	59,000	.68	....	
16,740	60,000	.80	....	
17,019	61,000	.92	....	
17,294	62,000	1.04	....	
17,577	63,000	1.33	....	
17,690	63,400	1.65	....	Tensile strength.
14,900	....	....	....	Load at time of fracture.

Elongation after rupture, 1″.90 = 19.0 per cent.

Elongation of inch sections, ″.19, ″.49*, ″.28, ″.16, ″.16, ″.11, ″.12, ″.13, ″.14, ″.12.

Area at fracture, 1″.20 × ″.10 = .120 square inch.

Contraction, 57 per cent.

Appearance of fracture fine, silky.

No. 1204.

$\frac{3}{16}$″ plate.
Marks, E lengthwise.
Sectional area, 1″.500 × ″.180 = .270 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
270	1,000	0.	0.	Initial load.
1,850	5,000	.0022	....	
2,700	10,000	.0045	−.0002	
4,050	15,000	.0065	....	
5,400	20,000	.0079	−.0002	
6,750	25,000	.0100	....	
8,100	30,000	.0117	−.0001	
9,450	35,000	.0136	....	
10,800	40,000	.0153	+.0001	
11,000	....	.0156	....	
11,200	....	.0158	....	
11,400	....	.0160	....	
11,600	....	.0164	....	
11,800	43,700	.0167	....	Elastic limit.
12,000	....	.0175	....	
12,200	....	.0193	....	
12,400	....	.0255 .0450	....	
12,200	....	.0572	....	
12,400	....	.0780	....	
12,600	....	.1650	....	
12,960	48,000	.334	....	
13,230	49,000	.339	....	
13,500	50,000	.342	....	
13,770	51,000	.365	....	
14,040	52,000	.387	....	
14,310	53,000	.43	....	
14,580	54,000	.47	....	
14,850	55,000	.53	....	
15,120	56,000	.56	....	
15,390	57,000	.65	....	
15,660	58,000	.71	....	
15,930	59,000	.80	....	
16,200	60,000	.86	....	
16,470	61,000	1.00	....	
16,740	62,000	1.13	....	
17,010	63,000	1.37	....	
17,110	63,370	1.70	....	Tensile strength.
14,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.00 = 20 per cent.

Elongation of inch sections, ″.14, ″.15, ″.17, ″.16, ″.19, ″.22, ″.52*, ″.20, ″.15, ″.10.

Area at fracture, 1″.25 × ″.09 = .113 square inch.

Contraction, 58.1 per cent.

Appearance of fracture fine silky.

No. 1205.

$\frac{3}{16}''$ plate.
Marks, 4–5 lengthwise.
Sectional area, 1''.502 × ''.172 = .258 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
258	1, 000	0.	0.	Initial load.
1, 290	5, 000	.0023	0.	
2, 580	10, 000	.0042	0.	
3, 870	15, 000	.0058	0.	
5, 160	20, 000	.0076	0.	
6, 450	25, 000	.0093	0.	
7, 740	30, 000	.0112	.0001	
10, 320	40, 000	.0146	.0001	
10, 800	41, 860	.0152	....	Elastic limit.
11, 000	....	.0162	....	
11, 200	....	.0182	....	
11, 352	44, 000	.0198	....	
11, 610	45, 000	.0307	....	
41, 868	46, 000	.0535	....	
12, 126	47, 000	.1700	....	
12, 384	48, 000	.2680	....	
12, 642	49, 000	.2950	....	
12, 900	50, 000	.3130	....	
13, 151	51, 000	.33	....	Rested under load one hour.
13, 416	52, 000	.33+	....	
13, 674	53, 000	.40	....	
13, 932	54, 000	.42	....	
14, 190	55, 000	.44	....	
14, 448	56, 000	.48	....	
14, 706	57, 000	.52	....	
14, 964	58, 000	.56	....	
15, 222	59, 000	.60	....	
15, 480	60, 000	.66	....	
15, 738	61, 000	.72	....	
15, 996	62, 000	.78	....	
16, 254	63, 000	.87	....	
16, 512	64, 000	.98	....	
16, 770	65, 000	1.08	....	
17, 028	66, 000	1.22	....	
17, 286	67, 000	1.50	....	
17, 500	67, 830	2.10	....	Tensile strength.
15, 500	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.51 = 25.1 per cent.

Elongation of inch sections, ''.19, ''.27, ''.57*, ''.20, ''.20, ''.23, ''.22, ''.19, ''.31, ''.13.

Area at fracture, 1''.17 × ''.11 = .129 square inch.

Contraction, 50 per cent.

Appearance of fracture fine silky.

No. 1206.

$\frac{3}{16}''$ plate.
Marks, B crosswise.
Sectional area, 1''.498×''.187 = .280 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
280	1,000	0.	0.	Initial load.
1,400	5,000	.0010	....	
2,800	10,000	.0028	.0002	
4,200	15,000	.0044	....	
5,600	20,000	.0061	.0002	
7,000	25,000	.0082	....	
8,400	30,000	.0098	.0002	
9,800	35,000	.0121	....	
11,200	40,000	.0142	.0007	
11,400	....	.0146	....	
11,600	....	.0150	....	
11,800	....	.0155	....	
12,000	....	.0160	....	
12,200	43,570	.0165	....	Elastic limit.
12,400	....	.0173	....	
12,600	....	.0187	....	
12,800	....	.0210	....	
13,000	....	.0275	....	
13,200	....	.0390	....	
13,400	....	.0545	....	
13,600	....	.0920	....	
13,700	....	.1210	....	
13,400	....	.1375	....	
13,600	....	.1470	....	
13,720	49,000	.1680	....	
14,000	50,000	.2900	....	
14,280	51,000	.3750	....	
14,560	52,000	.40	....	
14,840	53,000	.45	....	
15,120	54,000	.50	....	
15,400	55,000	.57	....	
15,680	56,000	.65	....	
15,960	57,000	.70	....	
16,240	58,000	.79	....	
16,520	59,000	.86	....	
16,800	60,000	1.04	....	
17,080	61,000	1.22	....	
17,240	61,570	1.42	....	Tensile strength. Tore apart from one edge.

Elongation after fracture, 1''.54=15.4 per cent.

Elongation of inch sections, ''.17, ''.32*, ''.13, ''.14, ''.13, ''.14, ''.11, ''.13, ''.14, ''.13.

Area at fracture, 1''.34×''.14 = .188 square inch.

Contraction, 32.9 per cent.

Appearance of fracture silky lamellar.

No. 1207.

$\frac{3}{16}''$ plate.
Marks, C crosswise.
Sectional area, 1''.495×''.195 = .292 per square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
292	1,000	0.	0.	Initial load.
1,460	5,000	.0014	....	
2,920	10,000	.0031	0.	
4,380	15,000	.0050	....	
5,840	20,000	.0067	0.	
7,300	25,000	.0083	....	
8,760	30,000	.0103	0.	
10,220	35,000	.0123	....	
11,680	40,000	.0143	0.	
13,000	....	.0158	....	
13,200	....	.0162	....	
13,400	....	.0164	....	
13,600	....	.0166	....	
13,800	....	.0169	....	
14,000	47,950	.0178	....	Elastic limit.
		.0300	....	
13,800	....	.0540	....	
		.0700	....	
14,016	48,000	.1700	....	
14,308	49,000	.2690	....	
14,600	50,000	.384	....	
14,892	51,000	.43	....	
15,184	52,000	.47	....	
15,476	53,000	.53	....	
15,768	54,000	.57	....	
16,060	55,000	.62	....	
16,352	56,000	.66	....	
16,644	57,000	.75	....	
16,936	58,000	.86	....	
17,228	59,000	.95	....	
17,520	60,000	1.15	....	
17,812	61,000	1.35	....	
18,020	61,710	1.94	....	Tensile strength.
17,800	....	....	....	Load at time of fracture.

Elongation after rupture, 2''.29 = 22.9 per cent.

Elongation of inch sections, ''.20, ''.20, ''.23, ''.22, ''.24, ''.22, ''.37*, ''.30, ''.17, ''.14.

Area at fracture, 1''.25×''.15 = .188 square inch.

Contraction, 35.6 per cent.

Appearance of fracture silky, lamellar.

No. 1208.

$\frac{3}{16}''$ plate.
Marks, D crosswise.
Sectional area, 1''.497 × ''.189=.283 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
283	1, 000	0.	0.	Initial load.
1, 415	5, 000	.0014		
2, 830	10, 000	.0031	0.	
4, 245	15, 000	.0049		
5, 660	20, 000	.0067	0.	
7, 075	25, 000	.0083		
8, 490	30, 000	.0102	0.	
9, 905	35, 000	.0123		
11, 320	40, 000	.0143	0.	
11, 600		.0144		
11, 800		.0146		
12, 000		.0150		
12, 200		.0153		
12, 400		.0157		
12, 600		.0159		
12, 800		.0162		
13, 000	45, 940	.0164		Elastic limit.
13, 100		.0240		
12, 200		.0333		
12, 400		.0600		
12, 600		.0720		
12, 800		.1020		
13, 000		.2400		
13, 200		.3500		
13, 301	47, 000	.43		
13, 584	48, 000	.44		
13, 867	49, 000	.46		
14, 150	50, 000	.48		
14, 433	51, 000	.52		
14, 716	52, 000	.55		
14, 999	53, 000	.60		
15, 280	54, 000	.65		
15, 565	55, 000	.71		
15, 848	56, 000	.78		
16, 131	57, 000	.88		
16, 414	58, 000	1.00		
16, 697	59, 000	1.10		
16, 980	60, 000	1.31		
17, 263	61, 000	1.69		
17, 300	61, 130	1.92		Tensile strength.
16, 100				Load at time of fracture.

Elongation after fracture, 2''.32=23.2 per cent.

Elongation of inch sections, ''.18, ''.21, ''.21, ''.30, ''.52,* ''.25, ''.17, ''.18, ''.16, ''.14.

Area at fracture, 1''.18×''.13=.153 square inch.

Contraction, 45.9 per cent.

Appearance of fracture silky, lamellar.

No. 1209.

$\frac{3}{16}$″ plate.
Marks, E crosswise.
Sectional area, 1″.497 × ″.180 = .269 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
269	1,000	0.	0.	Initial load.
1,345	5,000	.0005	0.	
2,690	10,000	.0017	0.	
4,035	15,000	.0032	....	
5,380	20,000	.0049	0.	
6,725	25,000	.0067	....	
8,070	30,000	.0082	0.	
9,415	35,000	.0102	....	
10,760	40,000	.0125	.0004	
11,000	....	.0129	....	
11,200	....	.0133	....	
11.400	....	.0137	....	
11,600	....	.0141	....	
11,800	....	.0145	....	
12,000	....	.0149	....	
12,200	....	.0153	....	
12,400	....	.0158	....	
12,600	46,840	.0163	....	Elastic limit.
12,800	....	.0174 .0190	....	
12,400	....	.0203	....	
12,600	....	.0230	....	
12,800	....	.0620	....	
12,600	....	.0845	....	
12,800	....	.1342 .1620	....	
13,000	....	.210	....	
13,181	49,000	.282	....	
13,450	50,000	.296	....	
13,719	51,000	.320	....	
13,988	52,000	.345	....	
14,257	53,000	.382	....	
14,526	54,000	.45	....	
14,795	55,000	.47	....	
15,064	56,000	.50	....	
15,333	57,000	.58	....	
15,602	58,000	.64	....	
15,871	59,000	.74	....	
16,140	60,000	.80	....	
16,409	61,000	.92	....	
16,678	62,000	1.08	....	
16,947	63,000	1.25	....	
16,990	....	1.38	....	
17,035	....	1.57	....	
17,050	....	1.68	....	
17,060	63,420	1.82 1.91	....	Tensile strength.
15,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.21=22.1 per cent.
Elongation of inch sections, ″.18, ″.19, ″.17, ″.17, ″.15, ″.18, ″.54,* ″.21, ″.24, ″.18.
Area at fracture, 1″.18 × ″.12 = .142 square inch.
Contraction, 47.2 per cent.
Appearance of fracture silky.

No. 1210.

$\frac{3}{16}$″ plate.
Marks, A crosswise.
Sectional area, 1″.497 × ″.182 = .272 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
272	1,000	0.	0.	Initial load.
1,360	5,000	.0005		
2,720	10,000	.0018	0.	
4,080	15,000	.0031		
5,440	20,000	.0050	0.	
6,800	25,000	.0065		
8,160	30,000	.0082	0.	
9,520	35,000	.0101		
10,880	40,000	.0123	0.	
12,000		.0142		
12,200		.0145		
12,400		.0148		
12,600		.0152		
12,800		.0155		
13,000		.0158		
13,200		.0161		
13,400	49,260	.0167		Elastic limit.
13,500		.0185 .1145		
13,600	50,000	.143		
13,872	51,000	.190		
14,144	52,000	.325		
14,416	53,000	.359		
14,688	54,000	.40		
14,960	55,000	.42		
15,232	56,000	.46		
15,504	57,000	.50		
15,776	58,000	.56		
16,048	59,000	.63		
16,320	60,000	.75		
16,592	61,000	.86		
16,864	62,000	.98		
17,136	63,000	1.17		
17,210	63,270	1.53		Tensile strength.
15,600				Load at time of fracture.

Elongation after rupture, 1″.81 = 18.1 per cent.

Elongation of inch sections, ″.17, ″.27, ″.52*, ″.16, ″.16, ″.12, ″.10, ″.10, ″.11, ″.10.

Area at fracture, 1″.17 × ″.13 = .152 square inch.

Contraction, 44.1 per cent.

Appearance of fracture, silky. Fine seam extends full-width of bar in fractured surface.

No. 1211.

¼" plate.
Marks, F lengthwise.
Sectional area, 1".493 × ".246 = .367 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
367	1,000	0.	0.	Initial load.
1,835	5,000	.0012	....	
3,670	10,000	.0031	....	
5,505	15,000	.0048	....	
7,340	20,000	.0068	....	
9,175	25,000	.0086	....	
11,010	30,000	.0104	....	
13,000	....	.0123	....	
13,200	....	.0125	....	
13,400	....	.0127	....	
13,600	....	.0128	....	
13,800	....	.0130	....	
14,000	38,150	.0132	....	Elastic limit.
14,100	....	.0144	....	
14,200	....	.0152	....	
14,400	....	.0175	....	
14,600	....	.0260	....	
14,800	....	.0365	....	
15,047	41,000	.0715	....	
15,414	42,000	.1365	....	
14,600	....	.1583	....	
14,800	....	.1720	....	
15,000	....	.1828	....	
15,200	....	.190	....	
15,414	42,000	.221	....	
15,781	43,000	.266	....	
16,148	44,000	.288	....	
16,515	45,000	.300	....	
16,882	46,000	.334	....	
17,249	47,000	.349	....	
17,616	48,000	.375	....	
17,983	49,000	.404	....	
18,350	50,000	.446	....	
18,717	51,000	.47	....	
19,084	52,000	.52	....	
19,451	53,000	.56	....	
19,818	54,000	.61	....	
20,185	55,000	.66	....	
20,552	56,000	.75	....	
20,919	57,000	.83	....	
21,286	58,000	.94	....	
21,653	59,000	1.03	....	
22,020	60,000	1.23	....	
22,387	61,000	1.47	....	
22,660	61,740	2.05	....	Tensile strength.
19,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2".44 = 24.4 per cent.

Elongation of inch sections, ".18, ".25, ".57*, ".32, ".22, ".20, ".18, ".18, ".17, ".17.

Area at fracture, 1".12 × ".17 = .190 square inch.

Contraction, 48.2 per cent.

Appearance of fracture, silky.

No. 1212.

¼" plate.
Marks, G lengthwise.
Sectional area, 1".499 × ".241 = .361 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
361	1,000	0.	0.	Initial load.
1,805	5,000	.0012	....	
3,610	10,000	.0030	....	
5,415	15,000	.0044	....	
7,220	20,000	.0061	....	
9,025	25,000	.0076	....	
10,830	30,000	.0093	....	
14,000	....	.0123	....	
14,200	....	.0124	....	
14,400	....	.0126	....	
14,600	....	.0127	....	
14,800	....	.0129	....	
15,000	41,550	.0132	....	Elastic limit.
15,100	....	.0171	....	
14,600	....	.0310	....	
14,800	....	.0440	....	
15,000	....	.0535	....	
15,200	....	.1150	....	
15,400	....	.1760	....	
15,523	43,000	.260	....	
15,884	44,000	.270	....	
16,245	45,000	.281	....	
16,606	46,000	.302	....	
16,967	47,000	.329	....	
17,328	48,000	.353	....	
17,689	49,000	.374	....	
18,050	50,000	.43	....	
18,411	51,000	.45	....	
18,772	52,000	.50	....	
19,133	53,000	.53	....	
19,494	54,000	.57	....	
19,855	55,000	.63	....	
20,216	56,000	.68	....	
20,577	57,000	.76	....	
20,938	58,000	.82	....	
21,399	59,000	.96	....	
21,660	60,000	1.06	....	
22,021	61,000	1.20	....	
22,382	62,000	1.48	....	
22,620	62,660	....	....	Tensile strength.
19,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2".43 = 24.3 per cent.

Elongation of inch sections, ".25, ".63*, ".30, ".24, ".19, ".16, ".17, ".16, ".18, ".15.

Area at fracture, 1".12 × ".16 = .179 square inch.

Contraction, 50.4 per cent.

Appearance of fracture fine, silky.

No. 1213.

¼" plate.
Marks, H lengthwise.
Sectional area, 1".498 × ".243 = .364 square inch.
Specimen convex on the side next micrometer.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
364	1,000	.0	0.	Initial load.
1,820	5,000	.0004		
3,640	10,000	.0017	0.	
5,460	15,000	.0029		
7,280	20,000	.0043	.0001	
9,100	25,000	.0059		
10,920	30,000	.0075	.0001	
14,000		.0104		
14,200		.0106		
14,400		.0108		
14,600		.0111		
14,800		.0112		
15,000		.0114		
15,200		.0115		
15,400		.0117		
15,600	42,860	.0119		Elastic limit.
14,700		.0165		
14,800		.0182		
15,000		.0215		
15,200		.0250		
15,400		.0349		
15,600		.0518 .0885		
15,800		.132		
15,200		.190		
15,400		.258		
15,600		.271		
15,800		.287		
16,016	44,000	.307		
16,380	45,000	.325		
16,744	46,000	.350		
17,108	47,000	.380		
17,472	48,000	.43		
17,836	49,000	.47		
18,200	50,000	.52		
18,564	51,000	.55		
18,928	52,000	.61		
19,292	53,000	.67		
19,656	54,000	.73		
20,020	55,000	.80		
20,384	56,000	.95		
20,748	57,000	1.06		
21,112	58,000	1.20		
21,476	59,000	1.50		
21,540	59,180	1.68		Tensile strength.
18,000				Load at time of fracture.

Elongation after fracture, 2".12 = 21.2 per cent.
Elongation of inch sections, ".12, ".13, ".13, ".12, ".13, ".15, ".19, ".26, ".66*, ".23.
Area at fracture, 1".12 × ".15 = .168 square inch.
Contraction, 53.8 per cent.
Appearance of fracture silky, lamellar.

No. 1214.

¼″ plate.
Marks, I lengthwise.
Sectional area, 1″.482 × ″.251 = .372 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
372	1,000	0.	0.	Initial load.
1,860	5,000	.0022	....	
3,720	10,000	.0044	—.0001	
5,580	15,000	.0065	....	
7,440	20,000	.0085	—.0001	
9,800	25,000	.0101	....	
11,160	30,000	.0120	—.0001	
13,000	....	.0138	....	
13,200	....	.0139	....	
13,400	....	.0141	....	
13,600	....	.0143	....	
13,800	....	.0145	....	
14,000	37,660	.0149	....	Elastic limit.
14,200	....	.0158	....	
14,000	....	.0362	....	
14,200	....	.0590	....	
14,400	....	.0638	....	
14,600	....	.0750	....	
14,800	....	.0922	....	
15,000	....	.220	....	
14,400	....	.229	....	
14,600	....	.240	....	
14,800	....	.250	....	
15,000	....	.279	....	
15,200	....	.293	....	
15,400	....	.295	....	
15,600	....	.298	....	
15,800	....	.307	....	
16,000	....	.332	....	
16,200	....	.337	....	
16,368	44,000	.346	....	
16,740	45,000	.366	....	
17,112	46,000	.412	....	
17,484	47,000	.45	....	
17,856	48,000	.47	....	
18,228	49,000	.55	....	
18,600	50,000	.61	....	
18,972	51,000	.67	....	
19,344	52,000	.71	....	
19,716	53,000	.78	....	
20,088	54,000	.85	....	
20,460	55,000	.97	....	
20,832	56,000	1.11	....	
21,204	57,000	1.34	....	
21,576	58,000	1.56	....	
21,820	58,660	2.12	....	Tensile strength.
18,100	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.52 = 25.2 per cent.

Elongation of inch sections, ″.18, ″.44*, ″.49*, ″.27, ″.24, ″.21, ″.19, ″.17, ″.18, ″.15.

Area at fracture, 1″.08 × ″.15 = .162 square inch.

Contraction, 56.5 per cent.

Appearance of fracture fine silky.

No. 1215.

¼″ plate.
Marks, J lengthwise.
Sectional area, 1″.499×″.257=.385 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
385	1,000	0.	0.	Initial load.
1,925	5,000	.0026	....	
3,850	10,000	.0051	—.0002	
5,775	15,000	.0073	....	
7,700	20,000	.0094	—.0002	
9,625	25,000	.0113	....	
11,550	30,000	.0130	—.0002	
14,000	....	.0154	....	
14,200	....	.0156	....	
14,400	....	.0158	....	
14,600	....	.0160	....	
14,800	....	.0162	....	
15,000	38,960	.0163	....	Elastic limit.
15,200	....	{.0168 .0198	....	
15,400	....	.0218	....	
15,600	....	.0237	....	
15,800	....	.0291	....	
16,000	....	{.0365 .0568	....	
16,200	....	.0835	....	
15,800	....	.1050	....	
16,000	....	.1500	....	
15,800	....	.1950	....	
16,000	....	.2160	....	
16,200	....	.2220	....	
16,400	....	.245	....	
15,600	....	.261	....	
16,000	....	.267	....	
16,200	....	.271	....	
16,400	....	.278	....	
16,600	....	.287	....	
16,800	....	.292	....	
16,940	44,000	.301	....	
17,325	45,000	.323	....	
17,710	46,000	.344	....	
18,095	47,000	.380	....	
18,480	48,000	.440	....	
18,865	49,000	.47	....	
19,250	50,000	.50	....	
19,635	51,000	.54	....	
20,020	52,000	.58	....	
20,405	53,000	.64	....	
20,790	54,000	.70	....	
21,175	55,000	.77	....	
21,560	56,000	.83	....	
21,945	57,000	.90	....	
22,330	58,000	1.05	....	
22,715	59,000	1.22	....	
23,100	60,000	1.40	....	
23,485	61,000	1.78	....	Tensile strength.
20,300	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.50 = 25.0 per cent.

Elongation of inch sections, ″.13, ″.18, ″.19, ″.24, ″.26, ″.62*, ″.29, ″.23, ″.21, ″.15.

Area at fracture, 1″.11×″.16 = .178 square inch.

Contraction, 53.8 per cent.

Appearance of fracture fine silky, slight lamination.

No. 1216.

¼" plate.
Marks, K lengthwise.
Sectional area, 1".499 × ".252 = .378 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
378	1,000	0.	0.	Initial load.
1,890	5,000	.0020	....	
3,780	10,000	.0041	....	
5,670	15,000	.0061	....	
7,560	20,000	.0081	....	
9,450	25,000	.0097	....	
11,340	30,000	.0115	....	
13,000	....	.0131	....	
13,200	....	.0132	....	
13,400	....	.0135	....	
13,600	....	.0137	....	
13,800	36,510	.0138	....	Elastic limit.
14,000	....	.0145	....	
14,200	....	.0151 .0162	....	
13,700	....	.0218	....	
13,800	....	.0243	....	
14,000	....	.0292	....	
14,200	....	.0380	....	
14,400	....	.0680	....	
14,600	....	.1250	....	
14,800	....	.156	....	
15,000	....	.208	....	
15,200	....	.216	....	
15,400	....	.246 .289	....	
15,600	....	.293	....	
15,800	....	.301	....	
16,000	....	.317	....	
16,254	43,000	.325	....	
16,632	44,000	.347	....	
17,010	45,000	.385	....	
17,388	46,000	.43	....	
17,766	47,000	.46	....	
18,144	48,000	.52	....	
18,522	49,000	.55	....	
18,900	50,000	.60	....	
19,278	51,000	.65	....	
19,650	52,000	.71	....	
20,034	53,000	.80	....	
20,412	54,000	.93	....	
20,790	55,000	1.02	....	
21,168	56,000	1.20	....	
21,546	57,000	1.36	....	
21,924	58,000	1.66	....	
21,980	58,150	1.86	....	Tensile strength.
18,600	....	....	....	Load at time of fracture.

Elongation after fracture, 2".39 = 23.9 per cent.

Elongation of inch sections, ".17, ".27, ".66*, ".29, ".22, ".20, ".18, ".14, ".13, ".13.

Area at fracture, 1".12 × ".14 = .157 square inch.

Contraction, 58.5 per cent.

Appearance of fracture silky, lamellar.

No. 1217.

¼" plate.
Marks, L lengthwise.
Sectional area, 1".498 × ".250 = .375 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
375	1,000	0.	0.	Initial load.
1,875	5,000	.0009	....	
3,750	10,000	.0024	0.	
5,625	15,000	.0039	....	
7,500	20,000	.0054	0.	
9,375	25,000	.0069	....	
11,250	30,000	.0087	0.	
15,000	....	.0122	....	
15,200	....	.0123	....	
15,400	....	.0124	....	
15,600	....	.0126	....	
15,800	....	.0128	....	
16,000	....	.0130	....	
16,200	....	.0132	....	
16,400	....	.0136	....	
16,600	....	.0140	....	
16,800	....	.0145	....	
17,000	45,310	.0148	....	Elastic limit.
16,600	....	.0161	....	
16,800	....	.0192	....	
17,000	....	.0500	....	
17,200	....	.1000	....	
16,000	....	.210	....	
16,200	....	.232	....	
16,400	....	.245	....	
16,600	....	.255	....	
16,800	....	.315	....	
17,000	....	.319	....	
17,250	46,000	.324	....	
17,625	47,000	.334	....	
18,000	48,000	.347	....	
18,375	49,000	.380	....	
18,750	50,000	.427	....	
19,125	51,000	.47	....	
19,500	52,000	.52	....	
19,875	53,000	.55	....	
20,250	54,000	.62	....	
20,625	55,000	.67	....	
21,000	56,000	.74	....	
21,375	57,000	.84	....	
21,750	58,000	.94	....	
22,125	59,000	1.10	....	
22,500	60,000	1.29	....	
22,875	61,000	1.52	....	
23,050	61,470	2.00	....	Tensile strength.
19,300	....	....	....	Load at time of fracture.

Elongation after fracture, 2".38 = 23.8 per cent.

Elongation of inch sections, ".19, ".21, ".29, ".60*, ".23, ".21, ".17, ".18, ".16, ".14.

Area at fracture, 1".14 × ".16 = .182 square inch.

Contraction, 51.5 per cent.

Appearance of fracture silky, lamellar.

No. 1218.

¼″ plate.
Marks, M lengthwise.
Sectional area, 1″.498 × ″.244 = .366 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
366	1,000	0.	0.	Initial load.
1,830	5,000	.0020		
3,660	10,000	.0040	0.	
5,490	15,000	.0062		
7,320	20,000	.0081	0.	
9,150	25,000	.0101		
10,980	30,000	.0120	0.	
14,000		.0149		
14,200		.0151		
14,400		.0153		
14,600		.0155		
14,800		.0157		
15,000		.0159		
15,200		.0161		
15,400		.0163		
15,600	42,620	.0165		Elastic limit.
15,700		.0174		
15,000		.0195 .0207		
15,200		.0223		
15,400		.0242		
15,600		.0290		
15,800		.0379		
16,000		.0425		
16,200		.0455		
16,400		.0860		
15,800		.1220		
16,000		.1335		
16,200		.170		
16,400		.330		
16,600		.370		
16,836	46,000	.378		
17,202	47,000	.406		
17,568	48,000	.47		
17,934	49,000	.50		
18,300	50,000	.54		
18,665	51,000	.61		
19,032	52,000	.68		
19,398	53,000	.75		
19,764	54,000	.83		
20,130	55,000	1.01		
20,496	56,000	1.12		
20,862	57,000	1.30		
21,228	58,000	1.70		
21,290	58,170	2.00		Tensile strength.
17,500				Load at time of fracture.

Elongation after fracture, 2″.47 = 24.7 per cent.

Elongation of inch sections, ″.26, ″.62*, ″.22, ″.17, ″.14, ″.19, ″.20, ″.22, ″.22, ″.23.

Area at fracture, 1″.15 × ″.12 = .138 square inch.

Contraction, 62.3 per cent.

Appearance of fracture fine, silky.

No. 1219.

¼″ plate.
Marks, N lengthwise.
Sectional area, 1″.499 × ″.244 = .366 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
366	1,000	0.	0.	Initial load.
1,830	5,000	.0037	0.	
3,660	10,000	.0062	—.0001	
5,490	15,000	.0083	....	
7,320	20,000	.0107	—.0004	
9,150	25,000	.0127	....	
10,980	30,000	.0145	—.0003	
14,000	....	.0181	....	
14,200	....	.0187	....	
14,400	39,340	.0201	....	Elastic limit.
14,600	....	.0220	....	
14,800	....	.0300 .0520	....	
15,000	....	.102	....	
15,200	....	.150	....	
15,400	....	.175	....	
15,600	....	.195 .260	....	
15,800	....	.301	....	
16,000	....	.312	....	
16,200	....	.320	....	
16,470	45,000	.340	....	
16,836	46,000	.378	....	
17,202	47,000	.415	....	
17,568	48,000	.472	....	
17,934	49,000	.515	....	
18,300	50,000	.570	....	
18,666	51,000	.60	....	
19,032	52,000	.65	....	
19,398	53,000	.86	....	
19,764	54,000	.95	....	
20,130	55 000	1.20	....	
20,400	55,740	1.68	....	Tensile strength.
16,400	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.04 = 20.4 per cent.

Elongation of inch sections, ″.10, ″.10, ″.10, ″.12, ″.16, ″.20, ″.21, ″.55*, ″.35, ″.15.

Area at fracture, 1″.13 × ″.13 = .147 square inch.

Contraction, 59.8 per cent.

Appearance of fracture fine, silky.

No. 1222.

¼" plate.
Marks, F crosswise.
Sectional area, 1".494 × ".248 = .371 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
371	1,000	0.	0.	Initial load.
1,855	5,000	.0012	....	
3,710	10,000	.0029	....	
5,565	15,000	.0043	....	
7,420	20,000	.0060	....	
9,275	25,000	.0075	....	
11,130	30,000	.0092	....	
13,000	....	.0108	....	
13,200	....	.0111	....	
13,400	....	.0112	....	
13,600	....	.0113	....	
13,800	....	.0115	....	
14,000	....	.0117	....	
14,200	....	.0119	....	
14,400	....	.0121	....	
14,600	....	.0123	....	
14,800	39,870	.0127	....	Elastic limit.
15,000	....	.0152	....	
15,200	....	.0250	....	
15,400	....	.0500	....	
15,600	....	.081	....	
15,800	....	.156	....	
16,000	....	.210	....	
16,200	....	.245	....	
16,324	44,000	.301	....	
16,695	45,000	.320	....	
17,066	46,000	.330	....	
17,437	47,000	.357	....	
17,808	48,000	.385	....	
18,179	49,000	.410	....	
18,550	50,000	.46	....	
18,921	51,000	.50	....	
19,292	52,000	.55	....	
19.663	53,000	.59	....	
20,034	54,000	.65	....	
20,405	55,000	.75	....	
20,776	56,000	.81	....	
21,147	57,000	.89	....	
21,518	58,000	.95	....	
21,889	59,000	1.05	....	
22,260	60.000	1.20	....	
22,631	61,000	1.46	....	
22,900	61,730	2.04	....	Tensile strength.
21,500	....	....	....	Load at time of fracture.

Elongation after fracture, 2".30 = 23.0 per cent.

Elongation at inch sections, ".17, ".22, ".56*, ".27, ".20, ".18, ".19, ".18, ".20, ".13.

Area at fracture, 1".19 × ".16 = .190 square inch.

Contraction, 48.8 per cent.

Appearance of fracture silky, slight lamination.

No. 1223.

¼″ plate.
Marks, G crosswise.
Sectional area, 1″.496 × ″.242 = .362 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
362	1,000	0.	0.	Initial load.
1,810	5,000	.0019	....	
3,620	10,000	.0039	0.	
5,430	15,000	.0058	....	
7,240	20,000	.0077	—.0001	
9,050	25,000	.0093	....	
10,860	30,000	.0112	—.0001	
14,000	38,680	.0143	....	Elastic limit.
14,200	....	.0149 .0178	....	
14,400	....	.0196	....	
14,600	....	.0220	....	
14,800	....	.0300	....	
15,000	....	.0450	....	
15,200	....	.0665	....	
15,400	....	.0730	....	
15,600	....	.0820	....	
15,000	....	.205	....	
15,200	....	.214	....	
15,400	....	.236	....	
15,600	....	.239	....	
15,800	....	.244	....	
16,000	....	.249	....	
16,290	45,000	.266	....	
16,652	46,000	.287	....	
17,014	47,000	.304	....	
17,376	48,000	.340	....	
17,738	49,000	.357	....	
18,100	50,000	.395	....	
18,462	51,000	.43	....	
18,824	52,000	.45	....	
19,186	53,000	.50	....	
19,548	54,000	.55	....	
19,910	55,000	.58	....	
20,272	56,000	.64	....	
20,634	57,000	.70	....	
20,996	58,000	.75	....	
21,358	59,000	.82	....	
21,720	60,000	.96	....	
22,082	61,000	1.04	....	
22,444	62,000	1.17	....	
22,760	62,870	1.46	....	Tensile strength.
21,600	....	....	....	Load at time of fracture.

Elongation after rupture, 1″.70 = 17.0 per cent.

Elongation of inch sections, —″.16, ″.43*, ″.18, ″.13, ″.16, ″.13, ″.13, ″.15, ″.12, ″.11.

Area at fracture, 1″.20 × ″.17 = .204 square inch.

Contraction, 43.6 per cent.

Appearance of fracture fine, silky. Thin blister on surface at point of fracture.

No. 1224.

¼″ plate.
Marks, H crosswise.
Sectional area, 1″.481 × ″.250 = .370 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
370	1,000	0.	0.	Initial load.
1,850	5,000	.0011	....	
3,700	10,000	.0030	—.0001	
5,550	15,000	.0049	....	
7,400	20,000	.0067	—.0002	
9,250	25,000	.0081	....	
11,100	30,000	.0098	—.0002	
14,000	....	.0125	....	
14,200	....	.0127	....	
14,400	....	.0128	....	
14,600	....	.0130	....	
14,800	....	.0133	....	
15,000	....	.0134	....	
15,200	....	.0136	....	
15,400	....	.0138	....	
15,600	....	.0142	....	
15,800	....	.0143	....	
16,000	....	.0145	....	
16,200	....	.0147	....	
16,400	....	.0150	....	
16,600	....	.0152	....	
16,800	....	.0153	....	
17,000	45,950	.0155	....	Elastic limit.
15,200	....	.0192	....	
15,400	....	.0201	....	
15,600	....	.0233	....	
15,800	....	.0280	....	
16,000	....	{ .0480 .1270	....	
16,200	....	.150	....	
16,400	....	.250	....	
16,600	....	.325	....	
16,800	....	.335	....	
17,000	....	.340	....	
17,200	....	.354	....	
17,390	47,000	.371	....	
17,760	48,000	.392	....	
18,130	49,000	.425	....	
18,500	50,000	.47	....	
18,870	51,000	.52	....	
19,240	52,000	.55	....	
19,610	53,000	.61	....	
19,980	54,000	.66	....	
20,350	55,000	.75	....	
20,720	56,000	.80	....	
21,090	57,000	.93	....	
21,460	58,000	1.05	....	
21,830	59,000	1.15	....	
22,200	60,000	1.37	....	
22,510	60,840	1.82	....	Tensile strength.

Elongation after fracture, 2″.18 = 21.8 per cent.

Elongation of inch sections, ″.20, ″.55*, ″.25, ″.17, ″.17, ″.15, ″.19, ″.15, ″.19, ″.16.

Area at fracture, ″1.14 × ″.17 = .194 square inch.

Contraction, 47.6 per cent.

Appearance of fracture silky, slight lamination.

No. 1225.

¼" plate.
Mark, I crosswise.
Sectional area, 1".497 × ".252 = .377 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
377	1,000	0.	0.	Initial load.
1,885	5,000	.0017	....	
3,770	10,000	.0035	0.	
5,655	15,000	.0052	....	
7,540	20,000	.0072	0.	
9,425	25,000	.0086	....	
11,310	30,000	.0102	0.	
14,000	....	.0129	....	
14,200	....	.0132	....	
14,400	....	.0134	....	
14,600	38,700	.0136	....	Elastic limit.
14,800	....	.0141	....	
14,900	....	.0149	....	
15,000	....	.0225	....	
14,400	....	.0290	....	
14,600	....	.0337	....	
14,800	....	.0380	....	
15,000	....	.0412	....	
15,200	....	.0600	....	
15,400	....	.0790	....	
15,000	....	.0980	....	
15,200	....	.115	....	
15,400	....	.131	....	
15,600	....	.155 .250	....	
15,800	....	.267	....	
16,000	....	.271	....	
16,211	43,000	.284	....	
16,588	44,000	.300	....	
16,965	45,000	.322	....	
17,342	46,000	.342	....	
17,719	47,000	.379	....	
18,096	48,000	.399	....	
18,473	49,000	.44	....	
18,850	50,000	.47	....	
19,227	51,000	.52	....	
19,604	52,000	.57	....	
19,981	53,000	.62	....	
20,358	54,000	.66	....	
20,735	55,000	.73	....	
21,112	56,000	.82	....	
21,489	57,000	.90	....	
21,866	58,000	1.00	....	
22,243	59,000	1.10	....	
22,620	60,000	1.34	....	
22,997	61,000	1.60	....	
23,100	61,230	1.95	....	Tensile strength.
21,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2".24 = 22.4 per cent.

Elongation of inch sections, ".19, ".18, ".50*, ".26, ".19, ".17, ".19, ".20, ".21, ".15.

Area at fracture, 1".18 × ".18 = .212 square inch.

Contraction, 43.8 per cent.

Appearance of fracture silky, stratified.

No. 1226.

¼″ plate.
Marks, I crosswise.
Sectional area, 1″.475 × ″.252 = .372 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
372	1,000	0.	0.	Initial load.
1,860	5,000	.0017	....	
3,720	10,000	.0036	−.0001	
5,580	15,000	.0051	....	
7,440	20,000	.0071	0.	
9,300	25,000	.0087	....	
11,160	30,000	.0104	0.	
13,400	....	.0128	....	
13,600	....	.0129	....	
13,800	37,100	.0131	....	Elastic limit.
14,000	....	.0137 .0200	....	
14,200	....	.0252	....	
14,400	....	.0440	....	
14,600	....	.0603	....	
14,800	....	.0782	....	
15,000	....	.0890	....	
15,200	....	.135	....	
15.400	....	.266	....	
15,600	....	.270	....	
15,800	....	.273	....	
16,000	....	.278	....	
16,200	....	.295	....	
16,368	44,000	.304	....	
16,740	45,000	.318	....	
17,112	46,000	.345	....	
17,484	47,000	.374	....	
17,856	48,000	.40	....	
18,228	49,000	.45	....	
18,600	50,000	.50	....	
18,972	51,000	.53	....	
19,344	52,000	.57	....	
19,716	53,000	.63	....	
20,088	54,000	.70	....	
20,460	55,000	.75	....	
20,832	56,000	.85	....	
21,204	57,000	.95	....	
21,576	58,000	1.01	....	
21,948	59,000	1.15	....	
22,320	60,000	1.46	....	
22,650	60,890	1.98	....	Tensile strength.
20,300	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.53=25.3 per cent.
Elongation of inch sections, ″.16, ″.17, ″.23, ″.22, ″.21, .″25, ″.25, ″.54*, ″.31, ″.19.
Area at fracture, 1″.14×″.17=.194 square inch.
Contraction, 47.8 per cent.
Appearance of fracture silky.

No. 1227.

¼″ plate.
Marks, J crosswise.
Sectional area, 1″.491 × ″.253 = .377 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
377	1, 000	0.	0.	Initial load.
1, 885	5, 000	.0015	....	
3, 770	10, 000	.0034	0.	
5, 655	15, 000	.0051	....	
7, 540	20, 000	.0068	0.	
9, 425	25, 000	.0085	....	
11, 310	30, 000	.0102	0.	
13, 800	....	.0124	....	
14, 000	....	.0127	....	
14, 200	....	.0129	....	
14, 400	....	.0131	....	
14, 600	38, 700	.0133	....	Elastic limit.
13, 400	....	.0218	....	
13, 6.0	....	.0250	....	
13, 800	....	.0400	....	
14, 000	....	.0660	....	
14, 200	....	{ .1005 .1240	....	
14, 400	....	.1600	....	
14, 600	....	.248	....	
14, 800	....	.300	....	
15, 080	40, 000	.333	....	
15, 457	41, 000	.350	....	
15, 834	42, 000	.381	....	
16, 211	43, 000	.420	....	
16, 588	44, 000	.47	....	
16, 965	45, 000	.50	....	
17, 342	46, 000	.53	....	
17, 719	47, 000	.58	....	
18, 096	48, 000	.67	....	
18, 473	49, 000	.71	....	
18, 850	50, 000	.79	....	
19, 227	51, 000	.87	....	
19, 604	52, 000	.98	....	
19, 981	53, 000	1.15	....	
20, 358	54, 000	1.38	....	
20, 735	55, 000	1.65	....	
20, 890	55, 380	2.15	....	Tensile strength.
17, 500	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.73=27.3 per cent.

Elongation of inch sections, ″.18, ″.25, ″.28, ″.68*, ″.27, ″24, ″24, ″.23, ″.21, ″.15.

Area at fracture, 1″.08 × ″.16=.173 square inch.

Contraction, 54.1 per cent.

Appearance of fracture fine silky.

No. 1228.

¼″ plate.
Marks, K crosswise.
Sectional area, 1″.498 × ″.255 = .382 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
382	1,000	0.	0.	Initial load.
1,910	5,000	.0015	....	
3,820	10,000	.0032	0.	
5,730	15,000	.0051	....	
7,640	20,000	.0060	0.	
9,550	25,000	.0085	....	
11,460	30,000	.0102	0.	
13,400	....	.0121	....	
13,600	....	.0123	....	
13,800	....	.0125	....	
14,000	36,650	.0127	....	Elastic limit.
13,400	....	.0171	....	
13,600	....	.0201	....	
13,800	....	.0229	....	
14,000	....	.0272	....	
14,200	....	.0345	....	
14,400	....	.0415	....	
14,600	....	.0460	....	
14,800	....	.100	....	
14,200	....	.109	....	
14,400	....	.115	....	
14,600	....	.124	....	
14,800	....	.250	....	
15,000	....	.300	....	
15,200	....	.365	....	
15,400	....	.376	....	
15,600	....	.383	....	
15,800	....	.390	....	
16,044	42,000	.43	....	
16,426	43,000	.45	....	
16,808	44,000	.49	....	
17,190	45,000	.52	....	
17,572	46,000	.58	....	
17,954	47,000	.65	....	
18,336	48,000	.76	....	
18,718	49,000	.80	....	
19,100	50,000	.95	....	
19,482	51,000	1.00	....	
19,864	52,000	1.15	....	
20,246	53,000	1.40	....	
20,590	53,900	1.95	....	Tensile strength.
17,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.48 = 24.8 per cent.
Elongation of inch sections, ″.17, ″.16, ″.18, ″.20, ″.22, ″.24, ″21, ″64*, ″.27, ″.19.
Area at fracture, 1″.10 × ″.17 = .187 square inch.
Contraction, 51.0 per cent.
Appearance of fracture silky lamellar.

No. 1229.

¼″ plate.
Marks, L crosswise.
Sectional area, 1″.492 × ″.250 = .373 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
373	1,000	0.	0.	Initial load.
1,865	5,000	.0019	....	
3,730	10,000	.0042	—.0002	
5,595	15,000	.0062	....	
7,460	20,000	.0082	—.0002	
9,325	25,000	.0099	....	
11,190	30,000	.0119	0.	
12,600	....	.0138	....	
12,800	....	.0140	....	
13,000	....	.0142	....	
13,200	....	.0148	....	
13,400	....	.0153	....	
13,600	....	.0156	....	
13,800	....	.0160	....	
14,000	....	.0166	....	
14,200	38,070	.0172	....	Elastic limit.
14,400	....	.0188 .0221	....	
14,600	....	.0242	....	
14,800	....	.0284	....	
15,000	....	.0341	....	
15,200	....	.0400	....	
15,400	....	.055	....	
15,600	....	.068	....	
15,800	....	.092	....	
15,400	....	.146	....	
15,600	....	.216	....	
15,000	....	.218	....	
15,200	....	.219	....	
15,400	....	.222	....	
15,600	....	.228	....	
15,800	....	.288	....	
16,000	....	.314	....	
16,200	....	.318	....	
16,400	....	.325	....	
16,600	....	.340	....	
16,800	....	.360	....	
17,000	....	.375	....	
17,158	46,000	.390	....	
17,531	47,000	.425	....	
17,904	48,000	.48	....	
18,277	49,000	.52	....	
18,650	50,000	.57	....	
19,023	51,000	.63	....	
19,396	52,000	.70	....	
19,769	53,000	.76	....	
20,142	54,000	.90	....	
20,515	55,000	.97	....	
20,888	56,000	1.15	....	
21,261	57,000	1.37	....	
21,410	57,400	1.72	....	Tensile strength.
18,500	....	....	....	Load at time of fracture.

Elongation after fracture, 1″.99 = 19.9 per cent.
Elongation of inch sections, ″.16, ″.48*, ″.27, ″.19, ″.17, ″.15, ″.15, ″.13, ″.13, ″.16.
Area at fracture, 1″.19 × ″.16 = .190 square inch.
Contraction, 49.1 per cent.
Appearance of fracture silky slight lamination.

No. 1230.

¼″ plate.
Marks, M crosswise.
Sectional area, 1″.498 × ″.246 = .369 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
369	1,000	0.	0.	Initial load.
1,845	5,000	.0014		
3,690	10,000	.0031	—.0002	
5,535	15,000	.0049		
7,380	20,000	.0067	—.0002	
9,225	25,000	.0082		
11,070	30,000	.0098	—.0002	
14,000		.0129		
14,200		.0132		
14,400		.0140		
14,600		.0144		
14,800		.0147		
15,000		.0149		
15,200	41,190	.0153		Elastic limit.
15,400		.0167		
15,600		.0182		
15,800		.0188		
16,000		.0205		
16,200		.0248 .0530		
16,400		.0660		
16,600		.0850		
16,800		.200		
17,000		.260		
17,200		.290		
17,400		.308		
17,600		.321		
17,800		.329		
18,081	49,000	.344		
18,450	50,000	.362		
18,819	51,000	.408		
19,188	52,000	.47		
19,557	53,000	.51		
19,926	54,000	.56		
20,295	55,000	.62		
20,664	56,000	.71		
21,033	57,000	.76		
21,402	58,000	.86		
21,771	59,000	.98		
22,140	60,000	1.09		
22,509	61,000	1.29		
22,878	62,000	1.64		
23,050	62,470	2.07		Tensile strength.
21,500				Load at time of fracture.

Elongation after fracture, 2″.40 = 24.0 per cent.

Elongation of inch sections, ″.17, ″.21, ″.20, ″.21, ″.57*, ″.26, ″.25, ″.22, ″.17, ″.14.

Area at fracture, 1″.15 × ″.17 = .195 square inch.

Contraction, 47.1 per cent.

Appearance of fracture silky, laminated, stratified.

No. 1231.

¼" plate.
Marks, N crosswise.
Sectional area, 1".498 × ".247 = .370 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
370	1,000	0.	0.	Initial load.
1,850	5,000	.0017	....	
3,700	10,000	.0036	0.	
5,500	15,000	.0052	....	
7,400	20,000	.0071	0.	
9,250	25,000	.0088	....	
11,100	30,000	.0104	0.	
14,000	....	.0133	....	
14,200	....	.0135	....	
14,400	....	.0137	....	
14,600	....	.0139	....	
14,800	....	.0142	....	
15,000	....	.0144	....	
15,200	....	.0146	....	
15,400	....	.0149	....	
15,600	....	.0151	....	
15,800	....	.0155	....	
16,000	....	.0159	....	
16,200	43,780	.0163	....	Elastic limit.
16,400	....	.0168	....	
16,600	....	.0177	....	
16,800	....	.0196	....	
17,000	....	.0325	....	
17,200	....	.0520	....	
17,400	....	.103	....	
17,600	....	.226	....	
17,800	....	.308	....	
18,000	....	.313	....	
18,130	49,000	.317	....	
18,500	50,000	.334	....	
18,870	51,000	.372	....	
19,240	52,000	.408	....	
19,610	53,000	.47	....	
19,980	54,000	.50	....	
20,350	55,000	.53	....	
20,720	56,000	.63	....	
21,090	57,000	.68	....	
21,460	58,000	.77	....	
21,830	59,000	.85	....	
22,200	60,000	.98	....	
22,570	61,000	1.20	....	
22,940	62,000	1.57	....	
22,960	62,050	1.88	....	Tensile strength.
20,400	....	....	....	Load at time of fracture.

Elongation after fracture, 2".21 = 22.1 per cent.

Elongation of inch sections, ".17, ".18, ".18, ".17, ".17, ".19, ".24, ".56*, ".20, ".15.

Area at fracture, 1".17 × ".18 = .211 square inch.

Contraction, 43.0 per cent.

Appearance of fracture silky, laminated.

No. 1232.

$\frac{5}{16}''$ plate.
Marks, R lengthwise.
Sectional area, 1''.499 × .''308 = .462 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
462	1,000	0.	0.	Initial load.
2,310	5,000	.0014	....	
4,620	10,000	.0031	0.	
6,930	15,000	.0049	....	
9,240	20,000	.0067	0.	
11,550	25,000	.0083	....	
13,860	30,000	.0099	0.	
18,000	....	.0130	....	
18,200	....	.0132	....	
18,400	....	.0135	....	
18,600	....	.0136	....	
18,800	....	.0138	....	
19,000	....	.0139	....	
19,200	....	.0141	....	
19,400	....	.0142	....	
19,600	42,420	.0144	....	Elastic limit.
19,800	....	.0158	....	
18,000	....	.0279	....	
18,200	....	.0315	....	
18,400	....	.0390	....	
18,600	....	.050	....	
18,800	....	.070	....	
19,000	....	.085	....	
19,200	....	.120	....	
19,404	42,000	.200	....	
19,866	43,000	.279	....	
20,328	44,000	.294	....	
20,790	45,000	.317	....	
21,252	46,000	.332	....	
21,714	47,000	.366	....	
22,176	48,000	.395	....	
22,638	49,000	.44	....	
23,100	50,000	.47	....	
23,562	51,000	.52	....	
24,024	52,000	.55	....	
24,486	53,000	.60	....	
24,948	54,000	.67	....	
25,410	55,000	.73	....	
25,872	56,000	.78	....	
26,334	57,000	.86	....	
26,796	58,000	.96	....	
27,258	59,000	1.09	....	
27,720	60,000	1.28	....	
28,182	61,000	1.71	....	
28,200	61,040	1.86	....	
28,240	61,130	2.10	....	Tensile strength.
24,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.72 = 27''.2 per cent.
Elongation of inch sections, ''.17, ''.20, ''.20, ''.24, ''.30, ''.64*, ''.31, ''.25, ''.23, ''.18.
Area at fracture, 1''.11 × ''.20 = .222 square inches.
Contraction, 51.9 per cent.
Appearance of fracture fine, silky.

No. 1233.

$\frac{5}{16}$" plate.
Marks, S lengthwise.
Sectional area, 1".499 × ".308 = .462 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
462	1,000	0.	0.	Initial load.
2,310	5,000	.0018		
4,620	10,000	.0038	0.	
6,930	15,000	.0056		
9,240	20,000	.0075	0.	
11,550	25,000	.0098		
13,860	30,000	.0111	0.	
16,170	35,000	.0128	.0003	
16,600		.0134		
16,800	36,360	.0136		Elastic limit.
17,000		.0148 .0155		
17,200		.0182		
17,400		.0235		
17,600		.052		
17,800		.120		
18,000		.195		
18,200		.280		
18,400		.295		
18,600		.304		
18,800		.311		
18,942	41,000	.316		
19,404	42,000	.347		
19,866	43,000	.374		
20,328	44,000	.401		
20,790	45,000	.44		
21,252	46,000	.48		
21,714	47,000	.52		
22,176	48,000	.57		
22,638	49,000	.62		
23,100	50,000	.67		
23,562	51,000	.72		
24,024	52,000	.82		
24,486	53,000	.91		
24,948	54,000	1.03		
25,410	55,000	1.15		
25,872	56,000	1.35		
26,334	57,000	1.95		Tensile strength.
21,800				Load at time of fracture.

Elongation after fracture, 2".63 = 26.3 per cent.

Elongation of inch sections, ".11, ".13, ".18, ".27, ".69*, ".26, ".26, ".25, ".26, ".22.

Area at fracture, 1".07 × ".18 = .193 square inch.

Contraction, 58.2 per cent.

Appearance of fracture fine, silky.

No. 1234.

$\frac{5}{16}''$ plate.
Marks, Q lengthwise.
Sectional area, 1″.499×″.311=.466 square inch.
Specimen badly warped.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
466	1,000	0.	0.	Initial load.
2,330	5,000	.0020	....	
4,660	10,000	.0040	0.	
6,990	15,000	.0057	....	
9,320	20,000	.0076	0.	
11,650	25,000	.0093	....	
13,980	30,000	.0111	.0001	
15,200	....	.0131	....	
15,400	....	.0133	....	
15,600	33,480	.0137	....	Elastic limit.
15,800	....	.0153	....	
16,000	....	.0162	....	
16,200	....	.0183	....	
16,400	....	.0224	....	
16,600	....	.0300	....	
16,800	....	.041	....	
17,000	....	.063	....	
17,200	....	.090	....	
17,400	....	.110	....	
17,600	....	.121	....	
17,800	....	.150	....	
18,000	....	.177	....	
18,200	....	.220	....	
18,400	....	.285	....	
18,640	40,000	.310	....	
19,106	41,000	.330	....	
19,572	42,000	.355	....	
20,038	43,000	.384	....	
20,504	44,000	.40	....	
20,970	45,000	.44	....	
21,436	46,000	.48	....	
21,902	47,000	.53	....	
22,368	48,000	.58	....	
22,834	49,000	.63	....	
23,300	50,000	.70	....	
23,766	51,000	.78	....	
24,232	52,000	.83	....	
24,698	53,000	.95	....	
25,164	54,000	1.05	....	
25,630	55,000	1.20	....	
26,096	56,000	1.50	....	
26,450	56,760	1.90	....	Tensile strength.
22,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.47=24.7 per cent.
Elongation of inch sections, ″.13, ″.15, ″.16, ″.18, ″.21, ″.22, ″.26, ″.69*, ″.29, ″.18.
Area at fracture, 1″.06×″.19=.201 square inch.
Contraction, 56.9 per cent.
Appearance of fracture fine silky, slight lamination.

No. 1235.

$\frac{5}{16}$″ plate.
Marks, O lengthwise.
Sectional area, 1″.498 × ″.301 = .451 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
451	1,000	0.	0.	Initial load.
4,255	5,000	.0024	....	
4,510	10,000	.0046	—.0001	
6,765	15,000	.0066	....	
9,020	20,000	.0085	—.0002	
11,275	25,000	.0108	....	
13,530	30,000	.0122	—.0002	
14,800	....	.0132	....	
15,000	33,260	.0136	....	Elastic limit.
15,200	....	.0149	....	
15,400	....	.0178	....	
15,600	....	.0230	....	
15,800	....	.0272	....	
16,000	....	.0320	....	
16,236	36,000	.0450	....	
16,687	37,000	.128	....	
17,138	38,000	.196	....	
17,589	39,000	.355	....	
18,040	40,000	.360	....	
18,491	41,000	.377	....	
18,942	42,000	.406	....	
19,393	43,000	.48	....	
19,844	44,000	.50	....	
20,295	45,000	.55	....	
20,746	46,000	.60	....	
21,197	47,000	.65	....	
21,648	48,000	.73	....	
22,099	49,000	.81	....	
22,550	50,000	.90	....	
23,001	51,000	1.03	....	
23,452	52,000	1.20	....	
23,903	53,000	1.37	....	
24,354	54,000	1.67	....	
24,510	54,350	2.30	....	Tensile strength.
20,100	....	....	....	Load at time of fracture.

Elongation after fracture, 3″ = 30 per cent.

Elongation of inch sections, ″.16, ″.20, ″.22, ″.25, ″.33, ″.42, ″.68*, ″.30, ″.25. ″.19.

Area at fracture, 1″.04 × ″.17 = .177 square inch.

Contraction, 60.8 per cent.

Appearance of fracture fine, silky.

No. 1236.

$\frac{5}{16}''$ plate.
Marks, P lengthwise.
Sectional area, 1″.497 × ″.304 = .455 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
455	1,000	0.	0.	Initial load.
2,275	5,000	.0025	....	
4,550	10,000	.0048	0.	
6,825	15,000	.0067	....	
9,100	20,000	.0086	0.	
11,375	25,000	.0104	....	
13,650	30,000	.0123	0.	
15,000	....	.0133	....	
15,200	....	.0135	....	
15,400	....	.0137	....	
15,600	....	.0139	....	
15,800	....	.0141	....	
16,000	....	.0143	....	
16,200	....	.0144	....	
16,400	....	.0146	....	
16,600	....	.0147	....	
16,800	....	.0150	....	
16,900	37,140	.0151	....	Elastic limit.
17,000	....	.0175	....	
16,800	....	.0212	....	
16,700	....	.0238	....	
16,800	....	.0248	....	
17,000	....	.0268	....	
17,200	....	.0320	....	
17,400	....	.0365	....	
17,600	....	.0430	....	
17,400	....	.0490	....	
17,600	....	.0590	....	
17,200	....	.0680	....	
17,400	....	.0760	....	
17,600	....	.0985	....	
17,800	....	.147	....	
18,000	....	.176	....	
18,200	40,000	.211	....	
18,655	41,000	.260	....	
19,110	42,000	.296	....	
19,565	43,000	.311	....	
20,020	44,000	.336	....	
20,475	45,000	.365	....	
20,930	46,000	.392	....	
21,385	47,000	.42	....	
21,840	48,000	.45	....	
22,295	49,000	.50	....	
22,750	50,000	.54	....	
23,205	51,000	.60	....	
23,660	52,000	.65	....	
24,115	53,000	.70	....	
24,570	54,000	.80	....	
25,025	55,000	.87	....	
25,480	56,000	.99	....	
25,935	57,000	1.12	....	
26,390	58,000	1.32	....	
26,845	50,000	1.60	....	
26,980	59,300	1.90	....	Tensile strength.
22,400	....	....	....	Load at time of rupture.

Elongation after fracture, 2″.54 = 25.4per cent.

Elongation of inch sections, ″.19, ″.29, ″.67*, ″.31, ″.21, ″.19, ″.15, ″.18, ″.19, ″.16.

Area at fracture, 1″.09 × ″.19 = .207 square inch.

Contraction, 54.5 per cent.

Appearance of fracture fine, silky.

No. 1237.

$\frac{5}{16}$″ plate.
Marks, R crosswise.
Sectional area, 1″.497 × ″.310 = .464 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
464	1,000	0.	0.	Initial load.
2,320	5,000	.0018	....	
4,640	10,000	.0036	0.	
6,960	15,000	.0058	....	
9,280	20,000	.0076	0.	
11,600	25,000	.0093	....	
13,920	80,000	.0111	.0001	
16,000	....	.0134	....	
16,200	....	.0138	....	
16,400	....	.0143	....	
16,600	....	.0147	....	
16,800	86,210	.0152	.0025	Elastic limit.
17,000	....	.0160	....	
17,200	....	.0179	....	
17,400	....	.0198	....	
17,600	....	.0231	....	
17,800	....	.0258	....	
18,000	....	.0308	....	
18,200	....	.0440	....	
18,400	....	.0735	....	
18,560	40,000	.0850	....	
19,024	41,000	.150	....	
19,488	42,000	.247	....	
19,952	48,000	.275	....	
20,416	44,000	.807	....	
20,880	45,000	.826	....	
21,344	46,000	.842	....	
21,808	47,000	.872	....	
22,272	48,000	.415	....	
22,736	49,000	.44	....	
23,200	50,000	.48	....	
23,664	51,000	.50	....	
24,128	52,000	.55	....	
24,592	53,000	.62	....	
25,056	54,000	.66	....	
25,520	55,000	.76	....	
25,984	56,000	.82	....	
26,448	57,000	.94	....	
26,912	58,000	1.04	....	
27,876	59,000	1.20	....	
27,840	60,000	1.89	....	
28,120	60,600	1.75	....	Tensile strength.
24,800	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.18 = 21.8 per cent.

Elongation of inch sections, ″.16, ″.58*, ″.26, ″.19, ″.19, ″.19, ″.12, ″.15, ″.17, ″.17.

Area at fracture, 1″.13 × ″.21 = .237 square inch.

Contraction, 48.9 per cent.

Appearance of fracture fine, silky, slight lamination.

No. 1238.

$\frac{5}{16}$'' plate.
Marks, S crosswise.
Sectional area, 1''.498 × ''.312 = .467 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
467	1,000	0.	0.	Initial load.
2,335	5,000	.0019	....	
4,670	10,000	.0041	0.	
7,005	15,000	.0062	....	
9,340	20,000	.0081	0.	
11,675	25,000	.0101	....	
14,010	30,000	.0119	0.	
16,000	....	.0135	....	
16,200	....	.0138	....	
16,400	....	.0142	....	
16,600	35,550	.0144	....	Elastic limit.
16,800	....	.0151	....	
17,000	....	.0157	....	
17,200	....	.0161	....	
17,400	....	.0167	....	
17,600	....	.0175	....	
17,800	....	.0187	....	
18,000	....	.0252	....	
17,600	....	.0285	....	
17,800	....	.0361	....	
18,000	....	.0430	....	
18,213	39,000	.0760	....	
18,680	40,000	.140	....	
19,147	41,000	.205	....	
19,614	42,000	.269	....	
20,081	43,000	.297	....	
20,548	44,000	.313	....	
21,015	45,000	.340	....	
21,482	46,000	.366	....	
21,949	47,000	.395	....	
22,416	48,000	.426	....	
22,883	49,000	.45	....	
23,350	50,000	.49	....	
23,817	51,000	.55	....	
24,284	52,000	.60	....	
24,751	53,000	.68	....	
25,218	54,000	.72	....	
25,685	55,000	.80	....	
26,152	56,000	.87	....	
26,619	57,000	.96	....	
27,086	58,000	1.08	....	
27,553	59,000	1.27	....	
28,020	60,000	1.53	....	
28,220	60,430	2.08	....	Tensile strength.
24,900	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.41 = 24.1 per cent.

Elongation of inch sections, ''.22, ''.58*, ''.27, ''.16, ''.15, ''.12, ''.16, .21, ''.32, ''.22.

Area at fracture, 1''.12 × ''.21 = .235 square inch.

Contraction, 49.7 per cent.

Appearance of fracture silky, slight lamination.

No. 1239.

$\frac{5}{16}$'' plate.
Marks, Q crosswise.
Sectional area, 1''.500 × ''.308 = .462 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
462	1, 000	0.	0.	Initial load.
2, 310	5, 000	. 0019	....	
4, 620	10, 000	. 0040	0.	
6, 930	15, 000	. 0058	....	
9, 240	20, 000	. 0076	0.	
11, 550	25, 000	. 0095	....	
13, 860	30, 000	. 0113	0.	
15, 800	34, 200	. 0130	....	Elastic limit.
16, 000	....	. 0147	....	
16, 200	....	. 0168	....	
16, 400	....	. 0187	....	
16, 600	....	. 0208	....	
16, 800	....	. 0241	....	
17, 000	....	. 0274	....	
17, 400	....	. 0312	....	
17, 600	....	. 0357	....	
17, 800	....	. 0418	....	
18, 000	....	. 0540	....	
18, 200	....	. 225	....	
18, 480	40, 000	. 265	....	
18, 942	41, 000	. 290	....	
19, 404	42, 000	. 306	....	
19, 866	43, 000	. 333	....	
20, 328	44, 000	. 356	....	
20, 790	45, 000	. 380	....	
21, 252	46, 000	. 425	....	
21, 714	47, 000	. 46	....	
22, 176	48, 000	. 50	....	
22, 638	49, 000	. 53	....	
23, 100	50, 000	. 59	....	
23, 562	51, 000	. 65	....	
24, 024	52, 000	. 70	....	
24, 486	53, 000	. 77	....	
24, 948	54, 000	. 87	....	
25, 410	55, 000	. 95	....	
25, 872	56, 000	1. 10	....	
26, 334	57, 000	1. 30	....	
26, 400	57, 140	1. 62	....	Tensile strength.
23, 100	....	1. 83	....	Load at time of rupture.

Elongation after fracture, 2''.43 = 24.3 per cent.

Elongation of inch sections, ''.17, ''.16, ''.17, ''.17, ''.19, ''.27, ''.66*, ''.27, ''.22, ''.15.

Area at fracture, 1''.10 × ''.21 = .231 square inch.

Contraction, 50 per cent.

Appearance of fracture silky, lamellar.

No. 1240.

$\frac{5}{16}$″ plate.
Marks, O crosswise.
Sectional area, 1″.499 × ″.307 = .460 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
460	1,000	0.	0.	Initial load.
2,300	5,000	.0022	....	
4,600	10,000	.0047	0.	
6,900	15,000	.0067	....	
9,200	20,000	.0087	0.	
11,500	25,000	.0107	....	
13,800	30,000	.0126	.0001	
16,000	....	.0152	....	
16,200	....	.0156	....	
16,400	....	.0158	....	
16,600	36,090	.0162	....	Elastic limit.
16,800	....	.0168	....	
17,000	....	.0174	....	
17,200	....	.0182	....	
17,400	....	.0196	....	
17,600	....	.0213	....	
17,800	....	.0253	....	
18,000	....	.0291	....	
18,200	....	.0320	....	
18,400	40,000	.0425	....	
18,860	41,000	.065	....	
19,320	42,000	.170	....	
19,780	43,000	.255	....	
20,240	44,000	.268	....	
20,700	45,000	.289	....	
21,160	46,000	.308	....	
21,620	47,000	.326	....	
22,080	48,000	.355	....	
22,540	49,000	.373	....	
23,000	50,000	.404	....	
23,460	51,000	.43	....	
23,920	52,000	.47	....	
24,380	53,000	.50	....	
24,840	54,000	.55	....	
25,300	55,000	.60	....	
25,760	56,000	.65	....	
26,220	57,000	.70	....	
26,680	58,000	.80	....	
27,140	59,000	.87	....	
27,600	60,000	.98	....	
28,060	61,000	1.06	....	
28,520	62,000	1.30	....	
28,980	63,000	1.65	....	
29,180	63,430	1.90	....	Tensile strength.
15,700	....	....	....	Load at time of fracture.

Elongation after fracture, 2′.27 = 22.7 per cent.
Elongation of inch sections, ″.18, ″.14, ″.17, ″.19, ″.19, ″.60*, ″.21, ″.22, ″.21, ″.16.
Area at fracture, 1″.13 × ″.21 = .237 square inch.
Contraction, 48.5 per cent.
Appearance of fracture silky.

No. 1241.

$\frac{5}{16}$″ plate.
Marks, P crosswise.
Sectional area, 1″.499 × ″.307 = .460 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
460	1,000	0.	0.	Initial load.
2,300	5,000	.0017	....	
4,600	10,000	.0034	—.0001	
6,900	15,000	.0051	....	
9,200	20,000	.0068	—.0001	
11,500	25,000	.0087	....	
13,800	30,000	.0102	—.0001	
15,600	....	.0121	....	
15,800	34,350	.0123	....	Elastic limit.
16,000	....	.0126	....	
		.0178	....	
16,200	....	.0300	....	
16,400	....	.0380	....	
16,600	....	.0500	....	
16,800	....	.0565	....	
17,000	....	.0652	....	
17,200	....	.0885	....	
17,480	38,000	.155	....	
17,940	39,000	.263	....	
18,400	40,000	.281	....	
18,860	41,000	.300	....	
19,320	42,000	.325	....	
19,780	43,000	.352	....	
20,240	44,000	.382	....	
20,700	45,000	.417	....	
21,160	46,000	.46	....	
21,620	47,000	.50	....	
22,080	48,000	.55	....	
22,540	49,000	.60	....	
23,000	50,000	.66	....	
23,460	51,000	.72	....	
23,920	52,000	.78	....	
24,380	53,000	.86	....	
24,840	54,000	.97	....	
25,300	55,000	1.13	....	
25,760	56,000	1.32	....	
26,220	57,000	1.65	....	
26,350	57,280	1.90	....	Tensile strength.
23,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.21 = 22.1 per cent.

Elongation of inch sections, ″.15, ″.13, ″.18, ″.16, ″.19, ″.29, ″.58*, ″.20, ″.18, ″.15.

Area at fracture, 1″.12 × ″.21 = .235 square inch.

Contraction, 48.9 per cent.

Appearance of fracture silky, slight lamination.

No. 1242.

$\frac{3}{8}''$ plate.
Marks, A crosswise.
Sectional area, 1″.498 × ″.368 = .551 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
551	1,000	0.	0.	
2,755	5,000	.0024	....	
5,510	10,000	.0048	0.	
8,265	15,000	.0072	....	
11,020	20,000	.0094	0.	
13,775	25,000	.0117	....	
15,200	....	.0131	....	
15,400	....	.0134	....	
15,600	28,310	.0138	....	Elastic limit.
15,800	....	.0146	....	
16,000	....	.0151	....	
16,200	....	.0157	....	
16,400	....	.0161	....	
16,530	30,000	.0166	.0038	
16,600	....	.0172	....	
16,800	....	.0182	....	
17,000	....	.0210	....	
17,200	....	.0273	....	
17,400	....	.0298	....	
17,632	32,000	.0350	....	
18,183	33,000	.0522	....	
18,734	34,000	.1120	....	
19,285	35,000	.184	....	
19,836	36,000	.230	....	
20,387	37,000	.250	....	
20,938	38,000	.263	....	
21,489	39,000	.291	....	
22,040	40,000	.315	....	
22,591	41,000	.352	....	
23,142	42,000	.373	....	
23,693	43,000	.417	....	
24,244	44,000	.43	....	
24,795	45,000	.48	....	
25,346	46,000	.53	....	
25,897	47,000	.59	....	
26,448	48,000	.66	....	
26,999	49,000	.74	....	
27,550	50,000	.83	....	
28,101	51,000	.94	....	
28,652	52,000	1.02	....	
29,203	53,000	1.20	....	
29,754	54,000	1.42	....	
30,305	55,000	1.76	....	
30,400	55,170	2.80	....	Tensile strength.

Elongation after fracture, 2″.50 = 25.0 per cent.
Elongation of inch sections, ″.27, ″.43*, ″.24, ″.23, ″.24, ″.26, ″.19, ″.25, ″.22, ″.17.
Area at fracture, 1″.25 × ″.27 = .337 square inch.
Contraction, 38.8 per cent.
Appearance of fracture silky, exceedingly lamellar.

No. 1243.

⅜″ plate.
Marks, B crosswise.
Sectional area, 1″.497 × ″.390 = .584 square inch.

Applied loads		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
584	1,000	0.	0.	Initial load.
2,920	5,000	.0019	....	
5,840	10,000	.0041	0.	
8,760	15,000	.0061	....	
11,680	20,000	.0081	.0001	
14,600	25,000	.0106	.0009	
14,800	....	.0109	....	
15,000	....	.0111	....	
15,200	....	.0113	....	
15,400	....	.0114	....	
15,600	....	.0117	....	
15,800	....	.0119	....	
16,000	....	.0122	....	
16,200	....	.0124	....	
16,400	....	.0126	....	
16,600	....	.0128	....	
16,800	....	.0131	....	
17,000	29,110	.0136	....	Elastic limit.
17,200	....	.0146	....	
17,400	....	.0162	....	
17,520	30,000	.0187	.0072	
17,800	....	.0205	....	
18,000	....	.0224	....	
18,104	31,000	.0239	....	
18,688	32,000	.0280	....	
19,272	33,000	.0450	....	
19,856	34,000	.0700	....	
20,440	35,000	.168	....	
21,024	36,000	.202	....	
21,608	37,000	.214	....	
22,192	38,000	.239	....	
22,776	39,000	.259	....	
23,360	40,000	.280	....	
23,944	41,000	.309	....	
24,528	42,000	.322	....	
25,112	43,000	.357	....	
25,696	44,000	.377	....	
26,280	45,000	.410	....	
26,864	46,000	.45	....	
27,448	47,000	.48	....	
28,032	48,000	.53	....	
28,616	49,000	.58	....	
29,200	50,000	.64	....	
29,784	51,000	.73	....	
30,368	52,000	.78	....	
30,952	53,000	.85	....	
31,536	54,000	.92	....	
32,120	55,000	1.09	....	
32,704	56,000	1.26	....	
33,288	57,000	1.77	....	
33,785	57,850	2.04	....	Tensile strength.
33,900	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.66 = 26.6 per cent.
Elongation of inch sections, ″.20, ″.20, ″.21, ″.20, ″.28, ″.68*, ″.30, ″.21, ″.20, ″.18.
Area at fracture, 1″.10 × .″25 = .275 square inch.
Contraction, 52.9 per cent.
Appearance of fracture silky, slight lamination.

No. 1244.

⅜" plate.
Marks, C crosswise.
Sectional area, 1".497 × ".375 = .561 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
561	1,000	0.	0.	Initial load.
2,805	5,000	.0019	....	
5,610	10,000	.0036	0.	
8,415	15,000	.0054	....	
11,220	20,000	.0074	0.	
14,025	25,000	.0089	0.	
16,830	30,000	.0110	0.	
18,400	....	.0123	....	
18,600	....	.0131	....	
18,800	....	.0136	....	
19,000	....	.0142	....	
19,200	....	.0144	....	
19,400	34,050	.0146	....	Elastic limit.
19,635	35,000	.0154	....	
19,800	....	.0194 .0341	....	
20,000	....	.0500	....	
20,200	....	.100	....	
20,400	....	.160	....	
20,600	....	.187	....	
20,757	37,000	.217	....	
21,318	38,000	.229	....	
21,879	39,000	.245	....	
22,440	40,000	.263	....	
23,001	41,000	.289	....	
23,562	42,000	.306	....	
24,123	43,000	.344	....	
24,684	44,000	.368	....	
25,245	45,000	.394	....	
25,806	46,000	.428	....	
26,367	47,000	.47	....	
26,928	48,000	.52	....	
27,489	49,000	.57	....	
28,050	50,000	.62	....	
28,611	51,000	.69	....	
29,172	52,000	.76	....	
29,733	53,000	.83	....	
30,294	54,000	.95	....	
30,855	55,000	1.07	....	
31,416	56,000	1.27	....	
31,977	57,000	1.55	....	
32,538	58,000	1.97	....	Tensile strength.
28,100	....	....	....	Load at time of rupture.

Elongation after fracture, 2".60 = 26.0 per cent.

Elongation of inch sections, ".20, ".20, ".27, ".59*, ".26, ".24, ".23, ".21, ".22, ".18.

Area at fracture, 1".13 × ".25 = ".282 square inch.

Contraction, 49.7.

Appearance of fracture silky, lamellar.

No. 1245.

⅜″ plate.
Marks, D crosswise.
Sectional area, 1″.498 × ″.380 = .569 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
569	1,000	0.	0.	Initial load.
2,845	5,000	.0019		
5,690	10,000	.0043	0.	
8,535	15,000	.0067		
11,380	20,000	.0087	0.	
14,225	25,000	.0109	0.	
16,400		.0133		
16,600		.0136		
16,800		.0142		
17,070	30,000	.0144	.0021	
17,400	30,580	.0151		Elastic limit.
17,600		.0156 .0168		
17,800		.0181		
18,000		.0207		
18,208	32,000	.0242		
18,400		.0271		
18,600		.0310		
18,777	33,000	.0358		
19,346	34,000	.0465		
19,915	35,000	.0775		
19,000		.1546		
19,200		.1612		
19,400		.1700		
19,600		.1790		
19,800		.1800		
20,000		.2150		
20,200		.2240		
20,484	36,000	.2278		
21,053	37,000	.241		
21,622	38,000	.255		
22,191	39,000	.288		
22,760	40,000	.304		
23,329	41,000	.331		
23,898	42,000	.370		
24,467	43,000	.395		
25,036	44,000	.427		
25,605	45,000	.46		
26,174	46,000	.50		
26,743	47,000	.55		
27,312	48,000	.60		
27,881	49,000	.68		
28,450	50,000	.74		
29,019	51,000	.82		
29,588	52,000	.92		
30,157	53,000	1.04		
30,726	54,000	1.19		
31,295	55,000	1.45		
31,800	55,890	1.83		Tensile strength.
27,500				Load at time of rupture.

Elongation after fracture, 2″.19 = 21.9 per cent.

Elongation of inch sections, ″.17, ″.17, ″.17, ″.17, ″.19, ″.63*, ″.21, ″.17, ″.18, ″.13.

Area at fracture, 1″.10 × ″.25 = .275 square inch.

Contraction, 51.7 per cent.

Appearance of fracture silky, lamellar.

No. 1246.

⅜" plate.
Marks, E crosswise.
Sectional area, 1".498 × ".383 = .574 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
574	1,000	0.	0.	Initial load.
2,870	5,000	.0019	....	
5,740	10,000	.0041	0.	
8,610	15,000	.0062	....	
11,480	20,000	.0082	0.	
14,350	25,000	.0108	.0007	
16,000	....	.0126	....	
16,200	....	.0130	....	
16,400	....	.0132	....	
16,600	....	.0137	....	
16,800	....	.0141	....	
17,000	....	.0143	....	
17,220	30,000	.0148	.0030	
17,400	....	.0151	....	
17,600	....	.0153	....	
17,800	....	.0158	....	
18,000	31,360	.0162	....	Elastic limit.
18,200	....	.0170	....	
18,400	....	.0178	....	
18,600	....	.0187	....	
18,800	....	.0201	....	
19,000	....	.0216	....	
19,200	....	.0232	....	
19,400	....	.0255	....	
19,600	....	.0290	....	
19,800	....	.0342	....	
20,090	35,000	.0446	....	
20,664	36,000	.064	....	
21,238	37,000	.120	....	
21,812	38,000	.222	....	
21,000	....	.235	....	
21,600	....	.242	....	
21,800	....	.252	....	
22,000	....	.290	....	
22,200	....	.312	....	
22,386	39,000	.319	....	
22,960	40,000	.338	....	
23,534	41,000	.362	....	
24,108	42,000	.406	....	
24,682	43,000	.43	....	
25,256	44,000	.46	....	
25,830	45,000	.52	....	
26,404	46,000	.57	....	
26,978	47,000	.63	....	
27,552	48,000	.70	....	
28,126	49,000	.78	....	
28,700	50,000	.86	....	
29,274	51,000	.96	....	
29,848	52,000	1.08	....	
30,422	53,000	1.27	....	
30,996	54,000	1.56	....	
31,210	....	1.82	....	
31,240	54,430	2.07 2.30	....	Tensile strength.
28,000	....	....	....	Load at time of fracture.

Elongation after rupture, 2."65=26.5 per cent.

Elongation of inch sections, ".18, ".18, ".16, ".19, ".24, ".26, ".30, ".63 ".29, ".22.

Area at fracture, 1".14 × ".26 = .296 square inch.

Contraction, 48.4 per cent.

Appearance of fracture silky, lamellar.

No. 1247.

⅜″ plate.
Marks, F crosswise.
Sectional area, 1″.499 × ″.380 = .570 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
570	1,000	0.	0.	Initial load.
2,850	5,000	.0019	....	
5,700	10,000	.0038	0.	
8,550	15,000	.0057	....	
11,400	20,000	.0075	0.	
14,250	25,000	.0097	.0001	
16,000	....	.0121	....	
16,200	28,420	.0125	....	Elastic limit.
16,400	....	.0133 .0171	....	
16,600	....	.0187	....	
16,800	....	.0221	....	
17,000	....	.0245	....	
17,200	....	.0261	....	
17,400	....	.0273	....	
17,670	31,000	.0311	....	
18,240	32,000	.0391	....	
18,810	33,000	.0580	....	
19,380	34,000	.0900	....	
19,950	35,000	.231	....	
20,520	36,000	.244	....	
21,090	37,000	.263	....	
21,660	38,000	.285	....	
22,239	39,000	.314	....	
22,800	40,000	.343	....	
23,370	41,000	.370	....	
23,940	42,000	.403	....	
24,510	43,000	.42	....	
25,080	44,000	.47	....	
25,650	45,000	.52	....	
26,220	46,000	.57	....	
26,790	47,000	.65	....	
27,360	48,000	.72	....	
27,930	49,000	.79	....	
28,500	50,000	.93	....	
29,070	51,000	1.02	....	
29,640	52,000	1.17	....	
30,210	53,000	1.43	....	
30,780	54,000	1.78	....	
30,990	54,370	2.24	....	Tensile strength.
27,500	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.61 = 26.1 per cent.

Elongation of inch sections, ″.22, ″.26, ″.24, ″.45,* ″.43,* ″.22, ″.23, ″.21, ″.18, ″.17.

Area at fracture, 1″.11 × ″.25 = .277 square inch.

Contraction, 51.4 per cent.

Appearance of fracture silky, very lamellar.

No. 1248.

⅜″ plate.
Marks, G crosswise.
Sectional area, 1″.496 × ″.366 = .548 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
548	1,000	0.	0.	Initial load.
2,740	5,000	.0014	....	
5,480	10,000	.0032	—.0001	
8,220	15,000	.0052	....	
10,960	20,000	.0069	—.0001	
13,700	25,000	.0086	—.0002	
16,440	30,000	.0102	—.0002	
17,200	31,390	.0110	....	Elastic limit.
17,400	....	.0127	....	
17,600	....	.0165	....	
17,800	....	.0195	....	
18,000	....	.0250	....	
18,200	....	.0305	....	
18,400	....	.0431	....	
18,600	....	.0555	....	
18,800	....	.0700	....	
19,000	....	.117	....	
19,180	35,000	.153	....	
19,728	36,000	.190	....	
19,000	....	.223	....	
19,200	....	.224	....	
19,400	....	.225	....	
19,600	....	.227	....	
19,800	....	.231	....	
20,000	....	.233	....	
20,276	37,000	.241	....	
20,824	38,000	.260	....	
21,372	39,000	.282	....	
21,920	40,000	.305	....	
22,468	41,000	.330	....	
23,016	42,000	.370	....	
23,564	43,000	.392	....	
24,112	44,000	.430	....	
24,660	45,000	.47	....	
25,208	46,000	.53	....	
25,756	47,000	.58	....	
26,304	48,000	.65	....	
26,852	49,000	.72	....	
27,400	50,000	.80	....	
27,948	51,000	.87	....	
28,496	52,000	.99	....	
29,044	53,000	1.09	....	
29,592	54,000	1.34	....	
30,140	55,000	1.81	....	
30,370	55,420	2.17	....	Tensile strength.
27,600	....	....	....	Load at time of fracture.

Elongation after fracture, 2.64 = 26.4 per cent.

Elongation of inch sections, ″.18, ″.22, ″.21, ″.23, ″.25, ″.23, ″.59*, ″.24, ″.28, ″.21.

Area at fracture, 1″.16 × ″.26 = .302 square inch.

Contraction, 44.9 per cent.

Appearance of fracture silky, lamellar.

No. 1249.

⅜″ plate.
Marks, H crosswise.
Sectional area, 1″.498 × ″.372 = ″.557 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
557	1,000	0.	0.	Initial load.
2,785	5,000	.0020	....	
5,570	10,000	.0041	0.	
8,355	15,000	.0063	....	
11,140	20,000	.0085	0.	
13,925	25,000	.0104	0.	
16,000	....	.0122	....	
16,200	....	.0125	....	
16,400	....	.0127	....	
16,600	....	.0129	....	
16,710	30,000	.0131	.0007	
16,800	....	.0133	....	
17,000	30,520	.0138	....	Elastic limit.
17,200	....	.0153	....	
17,400	....	.0200	....	
17,600	....	.0232	....	
17,800	....	.0260	....	
18,000	....	.0291	....	
18,200	....	.0375	....	
18,400	....	.0470	....	
18,600	....	.0521	....	
18,938	34,000	.0735	....	
19,495	35,000	.113	....	
18,800	....	.125	....	
19,000	....	.138	....	
19,200	....	.145	....	
19,495	35,000	.181	....	
20,052	36,000	.206	....	
20,609	37,000	.229	....	
21,166	38,000	.250	....	
21,723	39,000	.269	....	
22,280	40,000	.295	....	
22,837	41,000	.314	....	
23,394	42,000	.344	....	
23,951	43,000	.366	....	
24.508	44,000	.398	....	
25,065	45,000	.446	....	
25,622	46,000	.49	....	
26,179	47,000	.53	....	
26,736	48,000	.56	....	
27,293	49,000	.62	....	
27,850	50,000	.67	....	
28,407	51,000	.76	....	
28,964	52,000	.84	....	
29,521	53,000	.96	....	
30,078	54,000	1.08	....	
30,635	55,000	1.24	....	
31,192	56,000	1.54	....	
31,749	57,000	2.07	....	Tensile strength.
27,400	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.52 = 25.2 per cent.
Elongation of inch sections, ″.16, ″.18, ″.17, ″.22, ″.25, ″.21, ″.22, ″.25, ″.62*, ″.24.
Area at fracture, 1″.11 × ″.25 = .277 square inch.
Contraction, 50.2 per cent.
Appearance of fracture silky, slight lamination.

No. 1250.

⅜ plate.
Marks, I crosswise.
Sectional area, 1″.498 × ″.371 = .556 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
556	1,000	0.	0.	Initial load.
2,780	5,000	.0021	....	
5,560	10,000	.0042	0.	
8,340	15,000	.0066	....	
11,120	20,000	.0087	0.	
13,900	25,000	.0106	0.	
16,000	....	.0123	....	
16,200	....	.0127	....	
16,400	....	.0129	....	
16,680	30,000	.0131	.0005	
17,000	....	.0133	....	
17,200	....	.0136	....	
17,400	....	.0139	....	
17,600	....	.0142	....	
17,800	....	.0144	....	
18,000	....	.0148	....	
18,200	32,730	.0153	....	Elastic limit.
18,400	....	.0160	....	
18,600	....	.0169	....	
18,800	....	.0190	....	
19,000	....	.0230	....	
19,200	....	.0260	....	
19,460	35,000	.0291	....	
20,016	36,000	.0372	....	
20,572	37,000	.0590	....	
21,128	38,000	.094	....	
21,684	39,000	.117	....	
		.140	....	
21,000	....	.152	....	
21,200	....	.164	....	
21,400	....	.227	....	
21,600	....	.245	....	
21,800	....	.256	....	
22,240	40,000	.266	....	
22,796	41,000	.279	....	
23,352	42,000	.300	....	
23,908	43,000	.326	....	
24,464	44,000	.354	....	
25,020	45,000	.380	....	
25,576	46,000	.417	....	
26,132	47,000	.45	....	
26,688	48,000	.48	....	
27,244	49,000	.52	....	
27,800	50,000	.57	....	
28,356	51,000	.62	....	
28,912	52,000	.67	....	
29,468	53,000	.77	....	
30,024	54,000	.82	....	
30,580	55,000	.95	....	
31,136	56,000	1.08	....	
31,692	57,000	1.25	....	
32,248	58,000	1.47	....	
32,300	58,130	1.75	....	Tensile strength.
28,500	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.07 = 20.7 per cent.

Elongation of inch sections, ″.13, ″.74*, ″.23, ″.17, ″.13, ″.13, ″.15, ″.13, ″.12, ″.14.

Area at fracture, 1″.12 × ″.24 = .269 square inch.

Contraction, 51.6 per cent.

Appearance of fracture silky, slight lamination.

No. 1251.

⅜ plate.
Marks, J crosswise.
Sectional area, 1″.498 × ″.375 = .562 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
562	1,000	0.	0.	Initial load.
2,810	5,000	.0021	....	
5,620	10,000	.0044	0.	
8,430	15,000	.0069	....	
11,240	20,000	.0092	0.	
14,050	25,000	.0112	.0002	
16,000	....	.0132	....	
16,200	....	.0133	....	
16,400	....	.0136	....	
16,600	....	.0138	....	
16,860	30,000	.0141	.0011	
17,000	....	.0142	....	
17,200	....	.0143	....	
17,400	....	.0145	....	
17,600	....	.0147	....	
17,800	31,670	.0151	....	Elastic limit
18,000	....	.0156 .0159	....	
18,200	....	.0168	....	
18,400	....	.0189	....	
18,600	....	.0208	....	
18,800	....	.0232	....	
19,000	....	.0250	....	
19,108	34,000	.0295	....	
19,670	35,000	.0396	....	
20,232	36,000	.0551	....	
20,794	37,000	.1680	....	
21,356	38,000	.2361	.2178 .2175	Rested under initial load one hour. Reading after resting one hour.
21,356	38,000	.2368	....	
21,600	....	.2382	....	
21,800	....	.2395	....	
22,000	....	.2412	....	
22,200	....	.2450	....	
22,400	....	.2546	....	
22,600	....	.2633	....	
22,800	....	.2700	....	
23,042	41,000	.2815	....	
23,200	....	.2890	....	
23,400	....	.2965	....	
23,604	42,000	.3040	....	
24,166	43,000	.329	....	
24,728	44,000	.354	....	
25,290	45,000	.390	....	
25,852	46,000	.427	....	
26,414	47,000	.44	....	
26,976	48,000	.49	....	
27,538	49,000	.54	....	
28,100	50,000	.58	....	
28,662	51,000	.63	....	
29,224	52,000	.68	....	
29,786	53,000	.77	....	
30,348	54,000	.83	....	
30,910	55,000	.95	....	
31,472	56,000	1.09	....	
32,034	57,000	1.23	....	
32,596	58,000	1.49	....	
33,070	58,840	2.02	....	Tensile strength.
27,800	....	....	....	Load at time of fracture.

Elongation after rupture, 2″.70 = 27.0 per cent.
Elongation of inch sections, ″.25, ″.56*, ″.45, ″.29, ″.23, ″.20, ″.20, ″.19, ″.17, ″.16.
Area at fracture, 1″.09 × ″.25 = .272 square inch.
Contraction, 51.6 per cent.
Appearance of fracture silky.

No. 1252.

⅜″ plate.
Marks, A lengthwise.
Sectional area 1″.493 × ″.368 = .551 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
551	1,000	0.	0.	Initial load.
2,755	5,000	.0020	....	
5,510	10,000	.0039	0.	
8,265	15,000	.0069	....	
11,020	20,000	.0077	0.	
13,775	25,000	.0096	0.	
16,530	30,000	.0115	0.	
17,600	....	.0123	....	
17,800	....	.0124	....	
18,000	....	.0126	....	
18,200	33,030	.0129	....	Elastic limit.
18,400	....	.0138	....	
18,600	....	.0255	....	
18,800	....	.0370	....	
19,000	....	.0432	....	
19,285	35,000	.0571	....	
19,836	36,000	.160	....	
18,000	....	.192	....	
18,200	....	.198	....	
18,400	....	.209	....	
18,600	....	.23	....	
19,000	....	.24	....	
19,836	36,000	.255	....	
20,387	37,000	.26	....	
20,938	38,000	.28	....	
21,489	39,000	.31	....	
22,040	40,000	.35	....	
22,591	41,000	.37	....	
23,142	42,000	.41	....	
23,693	43,000	.44	....	
24,244	44,000	.49	....	
24,795	45,000	.54	....	
25,346	46,000	.57	....	
25,897	47,000	.62	....	
26,448	48,000	.72	....	
26,999	49,000	.78	....	
27,550	50,000	.86	....	
28,101	51,000	.98	....	
28,652	52,000	1.10	....	
29,203	53,000	1.35	....	
29,754	54,000	1.75	....	
29,900	54,260	2.10	....	Tensile strength.
24,400	....	....	....	Load at time of fracture.

Elongation after rupture, 2″.59 = 25.9 per cent.

Elongation of inch sections, ″.13, ″.14, ″.16, ″.19, ″.24, ″.30, ″.70*, ″.27, ″.26, ″.20.

Area at fracture, 1″.06 × ″.22 = .233 square inch.

Contraction, 57.7 per cent.

Appearance of fracture silky, lamellar.

No. 1253.

⅜" plate.
Marks, B lengthwise.
Sectional area, 1".493 × ".390 = .582 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
582	1,000	0.	0.	Initial load.
2,910	5,000	.0022	....	
5,820	10,000	.0048	.0002	
8,730	15,000	.0071	....	
11,640	20,000	.0093	.0002	
14,550	25,000	.0115	.0006	
17,460	30,000	.0141	.0008	
19,000	....	.0161	....	
19,200	....	.0163	....	
19,400	....	.0167	....	
19,600	....	.0171	....	
19,800	34,020	.0174	....	Elastic limit.
20,000	....	.0182	....	
20,200	....	.0195	....	
20,400	....	.0282	....	
20,600	....	.0480	....	
20,800	....	.075	....	
21,000	....	.122	....	
21,200	....	.135	....	
21,534	37,000	.161	....	
22,116	38,000	.184	....	
22,698	39,000	.210	....	
23,280	40,000	.243	....	
23,862	41,000	.256	....	
24,444	42,000	.275	....	
25,026	43,000	.299	....	
25,608	44,000	.332	....	
26,190	45,000	.350	....	
26,772	46,000	.392	....	
27,354	47,000	.41	....	
27,936	48,000	.45	....	
28,518	49,000	.49	....	
29,100	50,000	.53	....	
29,682	51,000	.57	....	
30,264	52,000	.63	....	
30,846	53,000	.68	....	
31,428	54,000	.75	....	
32,010	55,000	.85	....	
32,592	56,000	.95	....	
33,174	57,000	1.05	....	
33,756	58,000	1.21	....	
34,338	59,000	1.42	....	
34,760	59,730	1.97	....	Tensile strength.
28,500	....	....	....	Load at time of fracture.

Elongation after fracture, 2".61 = 26.1 per cent.

Elongation of inch sections, ".18, ".21, ".26, ".47*, ".54*, ".26, ".20, ".17, ".17, ".15.

Area at fracture, 1".06 × ".26 = .276 square inch.

Contraction, 52.6 per cent.

Appearance of fracture silky.

No. 1254.

⅜″ plate.
Marks, C lengthwise.
Sectional area, 1″.498 × ″.376 = .563 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
563	1,000	0.	0.	Initial load.
2,815	5,000	.0022	....	
5,630	10,000	.0044	0.	
8,445	15,000	.0066	....	
11,360	20,000	.0086	0.	
14,175	25,000	.0105	0.	
16,890	30,000	.0122	.0001	
17,800	....	.0128	....	
18,000	....	.0129	....	
18,200	....	.0131	....	
18,400	....	.0132	....	
18,600	....	.0134	....	
18,800	....	.0135	....	
19,000	....	.0137	....	
19,200	....	.0138	....	
19,400	....	.0139	....	
19,600	34,810	.0141	....	Elastic limit.
19,700	....	.0158	....	
19,800	....	.0285	....	
20,000	....	.0620	....	
20,200	....	.130	....	
20,400	....	.199	....	
20,600	....	.214	....	
20,831	37,000	.218	....	
21,394	38,000	.233	....	
21,957	39,000	.254	....	
22,520	40,000	.274	....	
23,083	41,000	.299	....	
23,646	42,000	.323	....	
24,209	43,000	.350	....	
24,772	44,000	.378	....	
25,335	45,000	.418	....	
25,898	46,000	.45	....	
26,461	47,000	.49	....	
27,024	48,000	.53	....	
27,587	49,000	.58	....	
28,150	50,000	.64	....	
28,713	51,000	.69	....	
29,276	52,000	.77	....	
29,839	53,000	.87	....	
30,402	54,000	.95	....	
30,965	55,000	1.09	....	
31,528	56,000	1.21	....	
32,091	57,000	1.50	....	
32,580	57,870	2.04	....	Tensile strength.
26,900	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.76 = 27.7 per cent.

Elongation of inch sections, ″.20, ″.19, ″.24, ″.28, ″.66*, ″.37, ″.25, ″.23, ″.20, ″.14.

Area at fracture, 1″.09 × ″.24 = .262 square inch.

Contraction, 53.5 per cent.

Appearance of fracture silky, lamellar.

No. 1255.

⅜″ plate.
Marks, D lengthwise.
Sectional area, 1″.489 × ″.383 = .574 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
574	1,000	0.	0.	Initial load.
2,870	5,000	.0023	....	
5,740	10,000	.0043	0.	
8,610	15,000	.0064	....	
11,480	20,000	.0083	.0000	
14,350	25,000	.0102	.0001	
16,600	28,920	.0125	....	Elastic limit.
16,800	....	.0129 .0204	....	
17,000	....	.024	....	
17,220	30,000	.035	....	
17,400	....	.039	....	
17,600	....	.044	....	
17,794	31,000	.052	....	
18,000	....	.059	....	
18,200	....	.069	....	
18,368	32,000	.077	....	
18,400	....	.098	....	
18,600	....	.109	....	
18,800	....	.121	....	
18,942	33,000	.187	....	
19,516	34,000	.213	....	
20,090	35,000	.234	....	
20,664	36,000	.253	....	
21,238	37,000	.276	....	
21,812	38,000	.306	....	
22,386	39,000	.325	....	
22,960	40,000	.359	....	
23,534	41,000	.383	....	
24,108	42,000	.423	....	
24,682	43,000	.47	....	
25,256	44,000	.50	....	
25,830	45,000	.55	....	
26,404	46,000	.61	....	
26,978	47,000	.66	....	
27,552	48,000	.73	....	
28,126	49,000	.81	....	
28,700	50,000	.93	....	
29,274	51,000	1.07	....	
29,848	52,000	1.19	....	
30,422	53,000	1.46	....	
30,840	53,730	1.98 2.86	....	Tensile strength.
26,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.82 = 28.2 per cent.
Elongation of inch sections, ″.22, ″.26, ″24, ″.22, ″.40, ″.62, ″.22, ″.21, ″.25, ″.18.
Area at fracture, 1″.06 × ″.24 = .254 square inch.
Contraction, 55.7 per cent.
Appearance of fracture silky, very lamellar.

No. 1256.

⅜″ plate.
Marks, E lengthwise.
Sectional area, 1″.493×″.385 = .577 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
577	1,000	0.	0.	Initial load.
2,885	5,000	.0028	....	
5,770	10,000	.0054	0.	
8,655	15,000	.0076	....	
11,540	20,000	.0104	0.	
14,425	25,000	.0123	0.	
17,310	30,000	.0142	.0007	
17,400	....	.0143	....	
17,600	....	.0146	....	
17,800	....	.0149	....	
18,000	....	.0151	....	
18,200	....	.0154	....	
18,400	....	.0158	....	
18,600	....	.0163	....	
18,800	....	.0165	....	
19,000	....	.0169	....	
19,200	....	.0172	....	
19,400	....	.0178	....	
19,600	33,970	.0183	....	Elastic limit.
19,800	....	.0192	....	
20,000	....	.0202	....	
20,195	35,000	.0211	....	
20,400	....	.0220	....	
20,600	....	.0230	....	
20,772	36,000	.0255	....	
21,000	....	.0302	....	
21,200	....	.0348	....	
21,349	37,000	.0468	....	
21,926	38,000	.0640	....	
22,503	39,000	.090	....	
23,080	40,000	.161	....	
22,200	....	.255	....	
23,000	....	.284	....	
23,200	....	.285	....	
23,400	....	.287	....	
23,657	41,000	.293	....	
24,234	42,000	.316	....	
24,811	43,000	.342	....	
25,388	44,000	.366	....	
25,965	45,000	.393	....	
26,542	46,000	.429	....	
27,119	47,000	.46	....	
27,696	48,000	.51	....	
28,272	49,000	.56	....	
28,850	50,000	.60	....	
29,427	51,000	.65	....	
30,004	52,000	.73	....	
30,581	53,000	.79	....	
31,158	54,000	.92	....	
31,735	55,000	1.00	....	
32,312	56,000	1.12	....	
32,889	57,000	1.31	....	
33,466	58,000	1.60	....	
33,660	58,340	2.12	....	Tensile strength.
27,300	....	....	....	Load at time of rupture.

Elongation after fracture, 2″.71 = 27.1 per cent.
Elongation of inch sections, ″.19, ″.26, ″.29, ″.66*, ″.36, ″.24, ″.19, ″.21, ″.17, ″.14.
Area at fracture, 1″.08×″.24 = .259 square inch.
Contraction, 55.1 per cent.
Appearance of fracture silky, slight lamination.

No. 1257.

⅜" plate.
Marks, F lengthwise.
Sectional area, 1".499 × ".378 = .567 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
567	1,000	0.	0.	Initial load.
2,835	5,000	.0023	....	
5,670	10,000	.0047	0.	
8,505	15,000	.0064	....	
11,340	20,000	.0082	—.0001	
14,175	25,000	.0101	0.	
17,010	30,000	.0121	0.	
18,000	....	.0126	....	
18,200	....	.0127	....	
18,400	....	.0128	....	
18,600	....	.0129	....	
18,800	....	.0131	....	
19,000	....	.0132	....	
19,200	....	.0134	....	
19,400	....	.0136	....	
19,600	....	.0137	....	
19,800	....	.0140	....	
18,600	34,920	.0468	....	Elastic limit.
18,800	....	.0510	....	
19,000	....	.0560	....	
19,200	....	.067	....	
19,400	....	.097	....	
19,600	....	.103	....	
19,800	....	.107	....	
20,000	....	.119	....	
19,400	....	.170	....	
19,600	....	.195	....	
19,800	....	.205	....	
20,000	....	.210	....	
20,200	....	.216	....	
20,412	36,000	.224	....	
20,976	37,000	.268	....	
21,546	38,000	.279	....	
22,113	39,000	.315	....	
22,680	40,000	.336	....	
23,247	41,000	.364	....	
23,814	42,000	.396	....	
24,381	43,000	.442	....	
24,948	44,000	.49	....	
25,515	45,000	.53	....	
26,082	46,000	.59	....	
26,649	47,000	.64	....	
27,216	48,000	.70	....	
27,783	49,000	.78	....	
28,350	50,000	.87	....	
28,917	51,000	.99	....	
29,484	52,000	1.15	....	
30,051	53,000	1.38	....	
30,618	54,000	1.71	....	
30,780	54,290	1.99	....	Tensile strength.
25,100	....	....	....	Load at time of rupture.

Elongation after fracture, 2".71 = 27.1 per cent.

Elongation of inch sections, ".14, ".17, ".21, ".26, ".26, ".19, ".26, ".78*, ".24, ".20.

Area at fracture, 1".04 × ".23 = .239 square inch.

Contraction, 57.8 per cent.

Appearance of fracture silky, lamellar.

No. 1258.

⅜″ plate.
Marks, G lengthwise.
Sectional area, 1″.498 × ″.365 = ″.547 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
547	1,000	0.	0.	Initial load.
2,735	5,000	.0022	....	
5,470	10,000	.0043	—.0002	
8,205	15,000	.0064	....	
10,940	20,000	.0082	—.0002	
13,675	25,000	.0102	....	
16,410	30,000	.0122	—.0001	
17,400	....	.0127	....	
17,600	....	.0128	....	
17,800	....	.0130	....	
18,000	32,910	.0132	....	Elastic limit.
18,100	....	.0238	....	
18,200	....	.0570	....	
18,400	....	.0764	....	
18,598	34,000	.084	....	
19,145	35,000	{ .125 .162	....	
19,692	36,000	.251	....	
20,239	37,000	.266	....	
20,786	38,000	.286	....	
21,333	39,000	.312	....	
21,880	40,000	.342	....	
22,427	41,000	.367	....	
22,974	42,000	.411	....	
23,521	43,000	.43	....	
24,068	44,000	.49	....	
24,615	45,000	.54	....	
25,162	46,000	.59	....	
25,709	47,000	.64	....	
26,256	48,000	.72	....	
26,803	49,000	.78	....	
27,350	50,000	.88	....	
27,897	51,000	1.02	....	
28,444	52,000	1.15	....	
28,991	53,000	1.40	....	
29,450	53,840	1.60	....	Tensile strength.
24,200	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.31 = 23.1 per cent.

Elongation of inch sections, ″.12, ″.12, ″.13, ″.13, ″.17, ″.19, ″.22, ″.37, ″.65*, ″.21.

Area at fracture, 1″.06 × ″.22 = .233 square inch.

Contraction, 57.4 per cent.

Appearance of fracture silky, lamellar.

No. 1259.

⅜" plate.
Marks, H lengthwise.
Sectional area, 1".498 × ".367 = .550 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
550	1,000	0.	0.	Initial load.
2,750	5,000	.0021	....	
5,500	10,000	.0043	0.	
8,250	15,000	.0067	....	
11,000	20,000	.0085	0.	
13,750	25,000	.0104	....	
16,500	30,000	.0124	0.	
16,800	30,550	.0129	....	Elastic limit.
17,000	....	.0137	....	
17,200	....	.0155	....	
17,400	....	.0177	....	
17,600	32,000	.0206	....	
17,800	....	.0233	....	
18,000	....	.0292	....	
18,150	33,000	.0361	....	
18,700	34,000	.056	....	
19,250	35,000	.114	....	
19,800	36,000	.225	....	
20,350	37,000	.241	....	
20,900	38,000	.249	....	
21,450	39,000	.271	....	
22,000	40,000	.296	....	
22,550	41,000	.327	....	
23,100	42,000	.352	....	
23,650	43,000	.375	....	
24,200	44,000	.414	....	
24,750	45,000	.49	....	
25,300	46,000	.51	....	
25,850	47,000	.53	....	
26,400	48,000	.59	....	
26,950	49,000	.63	....	
27,500	50,000	.70	....	
28,050	51,000	.80	....	
28,600	52,000	.88	....	
29,150	53,000	1.00	....	
29,700	54,000	1.10	....	
30,250	55,000	1.30	....	
30,800	56,000	1.59	....	
31,170	56,670	2.21	....	Tensile strength.
25,900	....	....	....	Load at time of rupture.

Elongation after fracture, 2".85 = 28.5 per cent.

Elongation of inch sections, ".16, ".14, ".38, ".64*, ".30, ".34, ".24, ".24, ".24, ".17.

Area at fracture, 1".06 × ".22 = .233 square inch.

Contraction, 57.6 per cent.

Appearance of fracture fine silky, slight lamination.

No. 1260.

⅜″ plate.
Marks, I lengthwise.
Sectional area, 1″.495×″.372 = .557 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
557	1,000	0.	0.	Initial load.
2,785	5,000	.0024	....	
5,570	10 000	.0044	0.	
8,855	15,000	.0067	....	
11,140	20,000	.0087	0.	
13,925	25,000	.0106	....	
16,710	30,000	.0127	.0006	
18,000	....	.0147	....	
18,200	....	.0149	....	
18,400	....	.0150	....	
18,600	33,390	.0156	....	Elastic limit.
18,800	....	.0164	....	
19,000	....	.0175	....	
19,200	....	.0181	....	
19,400	....	.0183	....	
19,495	35,000	.0191	.0059	
19,600	....	.0197	....	
19,800	....	.0205	....	
20,000	....	.0252	....	
20,200	....	.0363	....	
20,400	....	.0522	....	
20,609	37,000	.0790	....	
20,800	....	.105	....	
21,000	....	.153	....	
21,166	38,000	.211	....	
21,723	39,000	.236	....	
22,280	40,000	.255	....	
22,837	41,000	.267	....	
23,394	42,000	.296	....	
23,951	43,000	.318	....	
24,508	44,000	.337	....	
25,065	45,000	.370	....	
25,622	46,000	.400	....	
26,179	47,000	.43	....	
26,736	48,000	.47	....	
27,293	49,000	.52	....	
27,850	50,000	.55	....	
28,407	51,000	.60	....	
28,964	52,000	.67	....	
29,521	53,000	.72	....	
30,078	54,000	.80	....	
30,635	55,000	.88	....	
31,192	56,000	1.02	....	
31,749	57,000	1.16	....	
32,306	58,000	1.35	....	
32,863	59,000	1.72	....	
32,880	59,030	1.93	....	Tensile strength.
27,500	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.47 = 24.7 per cent.

Elongation of inch sections, ″.18, ″.19, ″.24, ″.59*, ″.38, ″.23, ″.19, ″.18, ″.14, ″.15.

Area at fracture, 1″.10 × ″.25 = .275 square inch.

Contraction, 50.4 per cent.

Appearance of fracture silky, stratified.

No. 1261.

⅜″ plate.
Marks, J lengthwise.
Sectional area, 1″.496 × ″.372 = .557 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
557	1,000	0.	0.	Initial load.
2,785	5,000	.0017	....	
5,570	10,000	.0037	0.	
8,355	15,000	.0056	....	
11,140	20,000	.0073	0.	
13,925	25,000	.0090	....	
16,710	30,000	.0109	0.	
18,400	....	.0117	....	
18,600	....	.0122	....	
18,800	33,750	.0127	....	Elastic limit.
19,000	....	.0240	....	
18,600	....	.0290	....	
18,800	....	.0360	....	
19,000	....	.0430	....	
19,200	....	.048	....	
19,495	35,000	.062	....	
20,052	36,000	.080	....	
20,609	37,000	.186	....	
21,166	38,000	.249	....	
21,723	39,000	.264	....	
22,280	40,000	.287	....	
22,837	41,000	.303	....	
23,394	42,000	.337	....	
23,951	43,000	.358	....	
24,508	44,000	.394	....	
25,065	45,000	.429	....	
25,622	46,000	.45	....	
26,179	47,000	.50	....	
26,736	48,000	.54	....	
27,293	49,000	.61	....	
27,850	50,000	.64	....	
28,407	51,000	.72	....	
28,964	52,000	.82	....	
29,521	53,000	.90	....	
30,078	54,000	1.03	....	
30,635	55,000	1.15	....	
31,192	56,000	1.40	....	
31,749	57,000	1.78	....	
31,820	57,130	2.08	....	Tensile strength.
26,300	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.60 = 26.0 per cent.

Elongation of inch sections, ″.17, ″.19, ″.20, ″.18, ″.20, ″.20, ″.25, ″.51*, ″.50*, ″.20.

Area at fracture, 1″.06 × ″.23 = .244 square inch.

Contraction, 56.2 per cent.

Appearance of fracture silky, slight lamination.

No. 1262.

$\frac{7}{16}$″ plate.
Marks, K lengthwise.
Sectional area, 1″.496×″.423 = .633 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
633	1,000	0.	0.	Initial load.
3,165	5,000	.0015	....	
6,330	10,000	.0029	0.	
9,495	15,000	.0044	....	
12,660	20,000	.0062	.0001	
15,825	25,000	.0077	.0001	
18,990	30,000	.0093	.0001	
21,000	....	.0106	....	
21,200	33,490	.0108	....	Elastic limit.
21,400	....	.0212	....	
21,522	34,000	.0292	....	
21,800	....	.0382	....	
22,000	....	.0523	....	
22,155	35,000	.071	....	
22,788	36,000	.192	....	
23,421	37,000	.203	....	
24,054	38,000	.220	....	
24,687	39,000	.232	....	
25,320	40,000	.249	....	
25,953	41,000	.276	....	
26,586	42,000	.294	....	
27,219	43,000	.317	....	
27,852	44,000	.350	....	
28,485	45,000	.378	....	
29,118	46,000	.404	....	
29,751	47,000	.43	....	
30,384	48,000	.49	....	
31,017	49,000	.52	....	
31,650	50,000	.56	....	
32,283	51,000	.63	....	
32,916	52,000	.68	....	
33,519	53,000	.76	....	
34,182	54,000	.85	....	
34,815	55,000	.94	....	
35,448	56,000	1.06	....	
36,081	57,000	1.22	....	
36,714	58,000	1.51	....	
37,347	59,000	2.03	....	Tensile strength.
31,900	....	....	....	Load at time of rupture.

Elongation after fracture, 2″.46 = 24.6 per cent.

Elongation of inch sections, ″.20, ″.60*, ″.34, ″.23, ″.15, ″.17, ″.17, ″.21, ″.21, ″.18.

Area at fracture, 1″.10×″.29 = .319 square inch.

Contraction, 49.6 per cent.

Appearance of fracture silky, slight lamination.

No. 1263.

$\frac{7}{16}''$ plate.
Marks, L lengthwise.
Sectional area, 1''.496×''.438 = .655 square inch.

Applied loads		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
655	1,000	0.	0.	Initial load.
3,275	5,000	.0025	....	
6,550	10,000	.0051	0.	
9,825	15,000	.0075	....	
13,100	20,000	.0097	0.	
16,375	25,000	.0118	0.	
19,650	30,000	.0152	.0021	
19,800	....	.0158	....	
20,000	....	.0162	....	
20,200	....	.0165	....	
20,400	....	.0171	....	
20,600	31,450	.0177	....	Elastic limit.
20,800	....	.0189	....	
21,000	....	.0232	....	
21,200	....	.0292	....	
21,400	....	.0331	....	
21,615	33,000	.039	....	
22,270	34,000	.057	....	
22,925	35,000	.094	....	
23,580	36,000	.174	....	
24,235	37,000	.182	....	
24,890	38,000	.199	....	
25,545	39,000	.216	....	
26,200	40,000	.245	....	
26,855	41,000	.255	....	
27,510	42,000	.279	....	
28,165	43,000	.301	....	
28,820	44,000	.325	....	
29,475	45,000	.359	....	
30,130	46,000	.384	....	
30,785	47,000	.420	....	
31,440	48,000	.44	....	
32,095	49,000	.50	....	
32,750	50,000	.52	....	
33,405	51,000	.58	....	
34,060	52,000	.65	....	
34,715	53,000	.71	....	
35,370	54,000	.78	....	
36,025	55,000	.85	....	
36,680	56,000	.98	....	
37,335	57,000	1.08	....	
37,990	58,000	1.27	....	
38,645	59,000	1.53	....	
38,900	59,390	1.90	....	Tensile strength.
34,900	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.25 = 22.5 per cent.

Elongation of inch sections, ''.20, ''.59*, ''.30, ''.21, ''.19, ''.15, ''.15, ''.17, ''.15, ''.14.

Area at fracture, 1''.12×''.30 = .336 square inch.

Contraction, 48.7 per cent.

Appearance of fracture silky, stratified.

No. 1264.

$\frac{7}{16}$'' plate.
Marks, M lengthwise.
Sectional area, 1''.496 × ''.425 = .636 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.**	*Inches.*	*Inch.*	
636	1,000	0.	0.	Initial load.
3,180	5,000	.0021	....	
6,360	10,000	.0043	0.	
9,540	15,000	.0062	....	
12,720	20,000	.0083	0.	
15,900	25,000	.0104	.0004	
19,080	30,000	.0144	.0031	
21,000	....	.0185	....	
21,200	....	.0195	....	
21,400	....	.0201	....	
21,600	....	.0207	....	
21,800	33,960	.0227	....	Elastic limit.
22,000	....	.0295	....	
22,260	35,000	.0403	....	
22,896	36,000	.0465	....	
23,532	37,000	.0780	....	
24,168	38,000	.188	....	
24,804	39,000	.209	....	
25,440	40,000	.220	....	
26,076	41,000	.235	....	
26,712	42,000	.255	....	
27,348	43,000	.276	....	
27,984	44,000	.294	....	
28,620	45,000	.316	....	
29,256	46,000	.344	....	
29,892	47,000	.369	....	
30,528	48,000	.404	....	
31,164	49,000	.44	....	
31,800	50,000	.48	....	
32,436	51,000	.51	....	
33,072	52,000	.56	....	
33,708	53,000	.60	....	
34,344	54,000	.65	....	
34,980	55,000	.72	....	
35,616	56,000	.78	....	
36,252	57,000	.86	....	
36,888	58,000	.99	....	
37,524	59,000	1.10	....	
38,160	60,000	1.26	....	
38,796	61,000	1.50	....	
39,210	61,650	1.96	....	Tensile strength.
32,700	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.41 = 24.1 per cent.

Elongation of inch sections, ''.16, ''.17, ''.21, ''.26, ''.64*, ''.22, ''.19, ''.18, ''.20, ''.18.

Area at fracture, 1''.09 × ''.27 = .294 square inch.

Contraction, 53.8 per cent.

Appearance of fracture fine, silky.

No. 1265.

$\frac{7}{16}$″ plate.
Marks, N lengthwise.
Sectional area, 1″.497 × ″.411 = .615 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
615	1,000	0.	0.	Initial load.
3,075	5,000	.0023	....	
6,150	10,000	.0048	0.	
9,225	15,000	.0073	....	
12,300	20,000	.0096	0.	
15,375	25,000	.0117	0.	
18,450	30,000	.0136	.0001	
20,000	....	.0148	....	
20,200	....	.0149	....	
20,400	....	.0151	....	
20,600	....	.0153	....	
20,800	....	.0156	....	
21,000	34,150	.0158	....	Elastic limit.
21,100	....	.0163	....	
21,200	....	.0172	....	
21,400	....	.0225	....	
21,525	35,000	.0350	....	
21,800	....	.0370	....	
22,000	....	.044	....	
22,140	36,000	.045	....	
22,755	37,000	.093	....	
23,370	38,000	.175	....	
23,985	39,000	.204	....	
24,600	40,000	.213	....	
25,215	41,000	.234	....	
25,830	42,000	.245	....	
26,445	43,000	.270	....	
27,060	44,000	.292	....	
27,675	45,000	.316	....	
28,290	46,000	.338	....	
28,905	47,000	.357	....	
29,520	48,009	.395	....	
30,135	49,000	.426	....	
30,750	50,000	.44	....	
31,365	51,000	.49	....	
31,980	52,000	.53	....	
32,595	53,000	.57	....	
33,210	54,000	.64	....	
33,825	55,000	.70	....	
34,440	56,000	.78	....	
35,055	57,000	.84	....	
35,670	58,000	.98	....	
36,285	59,000	1.12	....	
36,900	60,000	1.28	....	
37,515	61,000	1.52	....	
37,600	61,140	....	....	Tensile strength.
31,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.02 = 20.2 per cent.

Elongation of inch sections, ″.61, ″.24, ″.17, ″.17, ″.17, ″.15, ″.14, ″.13, ″.12, ″.12.

Area at fracture, 1″.10 × ″.27 = .297 square inch.

Contraction, 51.7 per cent.

Appearance of fracture silky, stratified, slight lamination.

No. 1266.

$\frac{7}{16}''$ plate.
Marks O lengthwise.
Sectional area, 1''.500 × ''.419 = .629 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
629	1, 000	0.	0.	Initial load.
3, 145	5, 000	.0016	....	
6, 290	10, 000	.0036	0.	
9, 435	15, 000	.0055	....	
12, 580	20, 000	.0073	0.	
15, 725	25, 000	.0092	.0003	
18, 870	30, 000	.0110	.0008	
19, 600	....	.0121	....	
19, 800	31, 480	.0123	....	Elastic limit.
20, 000	....	.0188	....	
19, 200	....	.0227	....	
19, 400	....	.0262	....	
19, 600	....	.0274	....	
19, 800	....	.0293	....	
20, 000	....	.0331	....	
20, 128	32, 000	.0375	....	
20, 400	....	.0413	....	
20, 600	....	.0438	....	
20, 757	33, 000	.0454	....	
21, 386	34, 000	.070	....	
22, 015	35, 000	.160	....	
22, 644	36, 000	.280	....	
23, 273	37, 000	.304	....	
23, 902	38, 000	.325	....	
24, 531	39, 000	.347	....	
25, 160	40, 000	.394	....	
25, 789	41, 000	.422	....	
26, 418	42, 000	.47	....	
27, 047	43, 000	.50	....	
27, 676	44, 000	.57	....	
28, 305	45, 000	.61	....	
28, 934	46, 000	.67	....	
29, 563	47, 000	.75	....	
30, 192	48, 000	.84	....	
30, 821	49, 000	.94	....	
31, 450	50, 000	1.05	....	
32, 079	51, 000	1.26	....	
32, 708	52, 000	1.52	....	
33, 208	52, 910	2.04	....	Tensile strength.
26, 000	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.90 = 29.0 per cent.

Elongation of inch sections, ''.22, ''.36, ''.76*, ''.33, ''.26, ''.24, ''.20, ''.20, ''.18, ''.15.

Area at fracture, 1''.02 × ''.25 = .255 square inch.

Contraction, 59.5 per cent.

Appearance of fracture fine, silky.

No. 1267.

$\frac{7}{16}$" plate.
Marks P lengthwise.
Sectional area, 1".496 × ".433 = .648 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
648	1,000	0.	0.	Initial load.
3,240	5,000	.0018		
6,480	10,000	.0036	.0001	
9,720	15,000	.0055		
12,960	20,000	.0072	.0001	
16,200	25,000	.0091	.0002	
19,440	30,000	.0108	.0003	
21,000		.0118		
21,200		.0120		
21,400	33,020	.0123		Elastic limit.
21,500		.0151 .0373		
21,600		.0385		
21,800		.0560		
22,032	34,000	.081		
22,680	35,000	.110		
23,328	36,000	.189		
23,976	37,000	.209		
24,624	38,000	.225		
25,272	39,000	.239		
25,920	40,000	.266		
26,568	41,000	.287		
27,216	42,000	.315		
27,864	43,000	.337		
28,512	44,000	.369		
29,160	45,000	.398		
29,808	46,000	.43		
30,456	47,000	.46		
31,104	48,000	.51		
31,752	49,000	.56		
32,400	50,000	.61		
33,048	51,000	.67		
33,696	52,000	.75		
34,344	53,000	.82		
34,992	54,000	.92		
35,640	55,000	1.04		
36,288	56,000	1.17		
37,584	58,000	1.37		
37,640	58,090	2.14		Tensile strength.
31,200				Load at time of fracture.

Elongation after fracture, 2".75 = 27.5 per cent.
Elongation of inch sections, ".19, ".23, ".30, ".69*, ".30, ".26, ".28, ".21, ".18, ".16.
Area at fracture, 1".05 × ".28 = .294 square inch.
Contraction, 54.6 per cent.
Appearance of fracture fine, silky.

No. 1268.

$\frac{7}{16}''$ plate.
Marks, Q lengthwise.
Sectional area, $1''.498 \times ''.423 = .634$ square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
634	1,000	0.	0.	Initial load.
3,170	5,000	.0024	....	
6,340	10,000	.0048	0.	
9,510	15,000	.0071	....	
12,680	20,000	.0093	.0002	
15,850	25,000	.0117	.0008	
19,020	30,000	.0144	.0016	
19,200	30,280	.0147	....	Elastic limit.
19,400	....	.0155	....	
19,600	....	.0171	....	
19,800	....	.0187	....	
20,000	....	.0198	....	
20,288	32,000	.0222	....	
20,400	....	.0243	....	
20,922	33,000	.0378	....	
21,556	34,000	.0760	....	
22,190	35,000	.149	....	
22,824	36,000	.218	....	
23,458	37,000*	.237	....	
24,092	38,000	.255	....	
24,726	39,000	.275	....	
25,360	40,000	.304	....	
25,994	41,000	.323	....	
26,628	42,000	.349	....	
27,262	43,000	.383	....	
27,896	44,000	.415	....	
28,530	45,000	.44	....	
29,164	46,000	.49	....	
29,798	47,000	.52	....	
30,432	48,000	.58	....	
31,066	49,000	.64	....	
31,700	50,000	.69	....	
32,334	51,000	.74	....	
32,968	52,000	.84	....	
33,602	53,000	.96	....	
34,236	54,000	1.06	....	
34,870	55,000	1.21	....	
35,504	56,000	1.53	....	
36,110	56,960	2.13	....	Tensile strength.
30,200	....	....	....	Load at time of fracture.

Elongation after fracture, 3.″07 = 30.7 per cent.

Elongation of inch sections, ″.20, ″.35, ″.65*, ″.28, ″.39, ″.28, ″.22, ″.21, ″.27, ″.22.

Area at fracture, $1''.05 \times ''.26 = .273$ square inch.

Contraction, 56.9 per cent.

Appearance of fracture fine, silky.

No. 1269.

$\frac{7}{16}$'' plate.
Sectional area, 1''.496×''.420 = .628 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
628	1,000	0.	0.	Initial load.
3,140	5,000	.0019	0.	
6,280	10,000	.0039	0.	
9,420	15,000	.0063	0.	
12,560	20,000	.0078	0.	
15,700	25,000	.0098	.0001	
18,840	30,000	.0118	.0002	
20,000	31,850	.0127	....	Elastic limit
20,200	....	.0137	....	
20,400	....	.0314	....	
20,600	....	.0402	....	
20,724	33,000	.0455	....	
21,352	34,000	.1110	....	
21,980	35,000	.1678	....	
22,608	36,000	.1800	....	
23,236	37,000	.1957	....	
23,864	38,000	.2130	....	
24,492	39,000	.26	....	
25,120	40,000	.29	....	
25,748	41,000	.31	....	
26,376	42,000	.33	....	
27,004	43,000	.39	....	
27,632	44,000	.41	....	
28,260	45,000	.43	....	
28,888	46,000	.46	....	
29,516	47,000	.50	....	
30,144	48,000	.54	....	
30,772	49,000	.59	....	
31,400	50,000	.68	....	
32,028	51,000	.70	....	
32,656	52,000	.78	....	
33,284	53,000	.88	....	
33,912	54,000	1.00	....	
34,540	55,000	1.18	....	
35,168	56,000	1.49	....	
35,680	56,820	2.04	....	Tensile strength.

Elongation after fracture, 2.''38 = 23.8 per cent.

Elongation of inch sections, ''.19, ''.23, ''.28, ''.61*, ''.21, ''.19, ''.20, ''.17, ''.14, ''.16.

Area at fracture, 1.''09×.''29 = .316 square inch.

Contraction, 49.7 per cent.

Appearance of fracture silky, slight lamination.

No. 1270.

$\frac{7}{16}''$ plate.
Marks, K crosswise.
Sectional area, 1″.498 × ″.424 = .635 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
635	1,000	0.	0.	Initial load.
3,175	5,000	.0018	....	
6,350	10,000	.0037	0.	
9,525	15,000	.0056	....	
12,700	20,000	.0074	0.	
15,875	25,000	.0095	....	
19,050	30,000	.0128	.0016	Elastic limit.
19,200	....	.0161	....	
19,400	....	.0190	....	
19,600	....	.0207	....	
19,800	....	.0217	....	
20,000	....	.0288	....	
20,320	32,000	.0263	....	
20,955	33,000	.0355	....	
21,590	34,000	.0540	....	
22,225	35,000	.110 .190	....	
22,860	36,000	.200	....	
23,495	37,000	.212	....	
24,130	38,000	.233	....	
24,765	39,000	.247	....	
25,400	40,000	.276	....	
26,035	41,000	.302	....	
26,670	42,000	.321	....	
27,305	43,000	.354	....	
27,940	44,000	.386	....	
28,575	45,000	.419	....	
29,210	46,000	.44	....	
29,845	47,000	.49	....	
30,481	48,000	.54	....	
31,115	49,000	.60	....	
31,750	50,000	.64	....	
32,385	51,000	.73	....	
33,020	52,000	.80	....	
33,655	53,000	.89	....	
34,290	54,000	1.00	....	
34,925	55,000	1.13	....	
35,560	56,000	1.30	....	
36,195	57,000	1.65	....	
36,450	57,400	2.05	....	Tensile strength.
33,900	....	....	....	Load at time of fracture.

Elongation after rupture, 2″.40 = 24.0 per cent.
Elongation of inch sections, ″.45*, ″.34*, ″.21, ″.20, ″.21, ″.24, ″.21, ″.20, ″.20, ″.14.
Area at fracture, 1″.16 × ″.31 = .360 square inch.
Contraction, 43.3 per cent.
Appearance of fracture silky, coarse lamination.

No. 1271.

$\frac{7}{16}''$ plate.
Marks, L crosswise.
Sectional area, 1''.497 × ''.438 = .656 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
656	1,000	0.	0.	Initial load.
3,280	5,000	.0016	....	
6,560	10,000	.0038	0.	
9,840	15,000	.0058	....	
13,120	20,000	.0076	0.	
16,400	25,000	.0094	....	
19,680	30,000	.0114	0.	
23,000	....	.0144	....	
23,200	....	.0146	....	
23,400	....	.0148	....	
23,600	....	.0150	....	
23,800	36,280	.0154	....	Elastic limit.
24,000	....	.0168	....	
24,200	....	.0228	....	
24,400	....	.0285	....	
24,600	....	.0355	....	
24,800	....	.0491	....	
24,928	38,000	.0550	....	
25,584	39,000	.087	....	
26,240	40,000	.216	....	
26,896	41,000	.291	....	
27,552	42,000	.305	....	
28,208	43,000	.331	....	
28,864	44,000	.352	....	
29,520	45,000	.375	....	
30,176	46,000	.401	....	
30,832	47,000	.43	....	
31,488	48,000	.50	....	
32,144	49,000	.54	....	
32,800	50,000	.58	....	
33,456	51,000	.62	....	
34,112	52,000	.67	....	
34,768	53,000	.72	....	
35,424	54,000	.81	....	
36,080	55,000	.90	....	
36,736	56,000	1.00	....	
37,392	57,000	1.13	....	
38,048	58,000	1.30	....	
38,704	59,000	1.57	....	
39,300	59,910	2.05	....	Tensile strength.
32,600	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.64 = 26.4 per cent.

Elongation of inch sections, ''.18, ''.23, ''.34, ''.63*, ''.23, ''.22, ''.22, ''.22, ''.22, ''.15.

Area at fracture, 1''.08 × ''.28 = .302 square inch.

Contraction, 54.0 per cent.

Appearance of fracture silky.

No. 1272.

$\frac{7}{16}$″ plate.
Marks, M crosswise.
Sectional area, 1″.497 × ″.421 = .630 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds*	*Inches.*	*Inch.*	
630	1,000	0.	0.	Initial load.
3,150	5,000	.0014		
6,300	10,000	.0033	0.	
9,450	15,000	.0053		
12,000	20,000	.0073	0.	
15,750	25,000	.0095		
18,900	30,000	.0143	.0032	
19,000		.0144		
19,200		.0145		
19,400	30,790	.0147		Elastic limit.
19,600		.0159		
19,800		.0182		
20,000		.0203		
20,160	32,000	.0214		
20,400		.0235		
20,790	33,000	.0265		
21,420	34,000	.0365		
22,050	35,000	.064 .108		
22,680	36,000	.168		
23,310	37,000	.189		
23,940	38,000	.208		
24,570	39,000	.224		
25,200	40,000	.243		
25,830	41,000	.260		
26,460	42,000	.287		
27,090	43,000	.301		
27,720	44,000	.331		
28,350	45,000	.356		
28,980	46,000	.387		
29,610	47,000	.421		
30,240	48,000	.44		
30,870	49,000	.50		
31,500	50,000	.54		
32,130	51,000	.60		
32,760	52,000	.65		
33,390	53,000	.72		
34,020	54,000	.79		
34,650	55,000	.86		
35,280	56,000	.98		
35,910	57,000	1.05		
36,540	58,000	1.23		
37,170	59,000	1.62		
37,520	59,560	2.01		Tensile strength.
32,300				Load at time of fracture.

Elongation after fracture, 2″.44 = 24.4 per cent.

Elongation of inch sections, ″.22, ″.63, ″.23, ″.23, ″.20, ″.17, ″.17, ″.20, ″.22, ″.17.

Area at fracture, 1″.11 × ″.29 = .322 square inch.

Contraction, 48.9 per cent.

Appearance of fracture silky.

No. 1273.

$\frac{7}{16}''$ plate.
Marks, N crosswise.
Sectional area, 1''.497 × ''.410 = .614 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds	*Pounds.*	*Inches.*	*Inch.*	
614	1,000	0.	0.	Initial load.
3,070	5,000	.0014	....	
6,140	10,000	.0033	0.	
9,210	15,000	.0054	....	
12,280	20,000	.0072	0.	
15,350	25,000	.0089	....	
18,420	30,000	.0123	.0013	
19,200	....	.0131	....	
19,400	....	.0139	....	
19,600	....	.0145	....	
19,800	....	.0149	....	
20,000	....	.0154	....	
20,200	....	.0155	....	
20,400	33,220	.0157	....	Elastic limit.
20,600	....	.0170	....	
20,800	....	.0183	....	
21,000	....	.0219	....	
21,200	....	.0255	....	
21,490	35,000	.0298	....	
22,104	36,000	.0428	....	
22,718	37,000	.090	....	
23,332	38,000	.187	....	
23,946	39,000	.192	....	
24,560	40,000	.201	....	
25,174	41,000	.218	....	
25,788	42,000	.233	....	
26,402	43,000	.253	....	
27,016	44,000	.272	....	
27,630	45,000	.293	....	
28,244	46,000	.318	....	
28,858	47,000	.337	....	
29,472	48,000	.369	....	
30,086	49,000	.403	....	
30,700	50,000	.43	....	
31,314	51,000	.47	....	
31,928	52,000	.51	....	
32,542	53,000	.55	....	
33,156	54,000	.61	....	
33,770	55,000	.65	....	
34,384	56,000	.71	....	
34,998	57,000	.79	....	
35,612	58,000	.87	....	
36,226	59,000	.98	....	
36,840	60,000	1.11	....	
37,454	61,000	1.29	....	
38,068	62,000	1.58	....	
38,100	62,050	1.78	....	Tensile strength.
33,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.08 = 20.8 per cent.

Elongation of inch sections, ''.19, ''.58*, ''.21, ''.22, ''.16, ''.16, ''.14, ''.15, ''.14, ''.13.

Area at fracture, 1''.14 × ''.29 = .331 square inch.

Contraction, 46.1 per cent.

Appearance of fracture silky.

No. 1274.

$\frac{7}{16}$″ plate.
Marks, O crosswise.
Sectional area, 1″.497 × ″.415 = .621 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
621	1,000	0.	0.	Initial load.
3,105	5,000	.0019	....	
6,210	10,000	.0041	.0001	
9,315	15,000	.0064	....	
12,420	20,000	.0084	.0004	
15,525	25,000	.0103	.0007	
18,630	30,000	.0127	.0012	
19,400	....	.0135	....	
19,600	....	.0137	....	
19,800	....	.0141	....	
20,000	....	.0147	....	
20,200	32,530	.0151	....	Elastic limit.
20,400	....	.0164	....	
20,600	....	.0189	....	
20,800	....	.0248	....	
21,000	....	.0283	....	
21,114	34,000	.0305	....	
21,735	35,000	.0430	....	
22,556	36,000	.0605	....	
22,977	37,000	.174	....	
23,598	38,000	.211	....	
24,219	39,000	.220	....	
24,840	40,000	.230	....	
25,401	41,000	.254	....	
26,082	42,000	.277	....	
26,703	43,000	.295	....	
27,324	44,000	.319	....	
27,945	45,000	.343	....	
28,566	46,000	.377	....	
29,187	47,000	.407	....	
29,808	48,000	.44	....	
30,429	49,000	.47	....	
31,050	50,000	.50	....	
31,671	51,000	.56	....	
32,292	52,000	.61	....	
32,913	53,000	.65	....	
33,534	54,000	.71	....	
34,155	55,000	.80	....	
34,776	56,000	.88	....	
35,397	57,000	.98	....	
36,018	58,000	1.14	....	
36,639	59,000	1.32	....	
37,260	60,000	1.56	....	
37,560	60,480	2.04	....	Tensile strength.
34,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.75 = 27.5 per cent.

Elongation of inch sections, ″.22, ″.28, ″.53*, ″.41, ″.35, ″.21, ″.17, ″.19, ″21, ″.18.

Area at fracture, 1″.15 × ″.30 = .345 square inch.

Contraction, 44.4 per cent.

Appearance of fracture silky, stratified.

No. 1275.

$\frac{7}{16}$″ plate.
Marks, P crosswise.
Sectional area, 1.″497 × ″.435 = .651 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
651	1,000	0.	0.	
3,255	5,000	.0018	....	
6,510	10,000	.0037	....	
9,765	15,000	.0055	....	
13,020	20,000	.0075	....	
16,275	25,000	.0095	....	
19,530	30,000	.0124	....	
20,000	....	.0131	....	
20,200	....	.0135	....	
20,400	....	.0142	....	
20,600	31,640	.0149	....	Elastic limit.
20,800	....	.0158	....	
21,000	....	.0168	....	
21,200	....	.0190	....	
21,400	....	.0215	....	
21,600	....	.0278	....	
21,800	....	.0311	....	
22,000	....	.0382	....	
22,134	34,000	.0605	....	
22,785	35,000	.101	....	
23,436	36,000	.133	....	
24,087	37,000	.211	....	
24,738	38,000	.229	....	
25,389	39,000	.245	....	
26,040	40,000	.265	....	
26,691	41,000	.291	....	
27,342	42,000	.312	....	
27,993	43,000	.338	....	
28,644	44,000	.367	....	
29,295	45,000	.399	....	
29,946	46,000	.434	....	
30,597	47,000	.47	....	
31,248	48,000	.50	....	
31,899	49,000	.55	....	
32,550	50,000	.61	....	
33,201	51,000	.67	....	
33,852	52,000	.72	....	
34,503	53,000	.80	....	
35,154	54,000	.94	....	
35,805	55,000	1.02	....	
36,456	56,000	1.14	....	
37,107	57,000	1.34	....	
37,570	57,710	1.73	....	Tensile strength.
38,200	....	....	....	Load at time of rupture.

Elongation after fracture, 2″.25 = 22.5 per cent.

Elongation of inch sections, ″.20, ″.26, ″.34, ″.58*, ″.22, ″.17, ″.13, ″.12, ″.11, ″.12.

Area at fracture, 1″.10 × ″.30 = .330 square inch.

Contraction, 49.3 per cent.

Appearance of fracture silky, slight lamination.

No. 1276.

$\frac{7}{16}$'' plate.
Marks, Q crosswise.
Sectional area, 1''.497 × ''.417 = .624 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
624	1, 000	0.	0.	Initial load.
3, 120	5, 000	.0019	....	
6, 240	10, 000	.0035	0.	
9, 860	15, 000	.0057	....	
12, 480	20, 000	.0074	0.	
15, 600	25, 000	.0091	0.	
18, 720	30, 000	.0110	0.	
20, 200	....	.0117	....	
20, 400	32, 690	.0119	....	Elastic limit.
20, 500	....	.0130	....	
20, 000	....	.0197 .0281	....	
20, 200	....	.0315	....	
20, 400	....	.0348	....	
20, 600	....	.0431	....	
20, 800	....	.0565	....	
21, 000	....	.100	....	
21, 216	34, 000	.141	....	
21, 840	35, 000	.234	....	
23, 464	36, 000	.247	....	
23, 088	37, 000	.267	....	
23, 712	38, 000	.290	....	
24, 336	39, 000	.320	....	
24, 960	40, 000	.341	....	
25, 584	41, 000	.385	....	
26, 208	42, 000	.418	....	
26, 832	43, 000	.45	....	
27, 456	44, 000	.50	....	
28, 080	45, 000	.55	....	
28, 704	46, 000	.60	....	
29, 328	47, 000	.67	....	
29, 952	48, 000	.76	....	
30, 576	49, 000	.81	....	
31, 200	50, 000	.91	....	
31, 824	51, 000	1.02	....	
32, 448	52, 000	1.15	....	
33, 072	53, 000	1.36	....	
33, 697	54, 000	1.67	....	
33, 960	54, 420	2.15	....	Tensile strength.
27, 000	....	....	....	Load at time of fracture.

Elongation after fracture, 2''.99 = 29.9 per cent.

Elongation of inch sections, ''.18, ''.19, ''.23, ''.22, ''.25, ''.29, ''.39, ''73*, ''.31, ''.20.

Area at fracture, 1''.04 × ''.25 = .260 square inch.

Contraction, 58.3 per cent.

Appearance of fracture silky.

No. 1277.

½" plate.
Marks, R crosswise.
Sectional area, "1.498 × ".482 = .722 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
722	1,000	0.	0.	Initial load.
3,610	5,000	.0018	....	
7,220	10,000	.0038	0.	
10,830	15,000	.0059	....	
14,440	20,000	.0078	0.	
18,050	25,000	.0096	0.	
21,660	30,000	.0116	0.	
23,400	....	.0134	....	
23,600	....	.0134	....	
23,800	32,960	.0137	....	Elastic limit.
24,000	....	.0154	....	
24,200	....	.0272	....	
24,400	....	.0290	....	
24,548	34,000	.0315	....	
25,270	35,000	.050	....	
25,992	36,000	.149	....	
26,714	37,000	.189	....	
27,436	38,000	.196	....	
28,158	39,000	.218	....	
28,880	40,000	.234	....	
29,602	41,000	.251	....	
30,324	42,000	.273	....	
31,046	43,000	.292	....	
31,768	44,000	.325	....	
32,490	45,000	.342	....	
33,212	46,000	.369	....	
33,934	47,000	.392	....	
34,656	48,000	.425	....	
35,378	49,000	.48	....	
36,100	50,000	.51	....	
36,822	51,000	.55	....	
37,544	52,000	.60	....	
38,266	53,000	.65	....	
38,988	54,000	.73	....	
39,710	55,000	.80	....	
40,432	56,000	.88	....	
41,154	57,000	.98	....	
41,876	58,000	1.10	....	
42,598	59,000	1.30	....	
43,320	60,000	1.64	....	
43,670	60,480	2.01	....	Tensile strength.
37,500	....	....	....	Load at time of fracture.

Elongation after fracture, 2".46 = 24.6 per cent.

Elongation of inch sections, ".19, ".22, ".22, ".24, ".48*, ".36, ".18, ".20, ".20, ".17.

Area at fracture, 1".11 × ".34 = .377 square inch.

Contraction, 47.8 per cent.

Appearance of fracture silky, slight lamination.

No. 1278.

½″ plate.
Marks, S crosswise.
Sectional area, 1″.498 × ″.466 = .698 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
698	1,000	0.	0.	Initial load.
3,490	5,000	.0018	....	
6,980	10,000	.0039	0.	
10,470	15,000	.0062	....	
13,960	20,000	.0082	.0002	
17,450	25,000	.0115	.0018	
18,200	....	.0121	....	
18,600	....	.0126	....	
19,000	....	.0132	....	
19,400	....	.0137	....	
19,800	28,370	.0145	....	Elastic limit.
20,200	....	.0158	....	
20,600	....	.0202	....	
20,940	30,000	.0244	.0127	
21,400	....	.0292	....	
21,800	....	.0325	....	
22,336	32,000	.0568	....	
23,034	33,000	.0905	....	
23,732	34,000	.155	....	
24,430	35,000	.188	....	
25,128	36,000	.204	....	
25,826	37,000	.220	....	
26,524	38,000	.248	....	
27,222	39,000	.261	....	
27,920	40,000	.286	....	
28,618	41,000	.311	....	
29,316	42,000	.334	....	
30,014	43,000	.365	....	
30,712	44,000	.394	....	
31,410	45,000	.418	....	
32,108	46,000	.48	....	
32,806	47,000	.52	....	
33,504	48,000	.56	....	
34,202	49,000	.61	....	
34,900	50,000	.66	....	
35,598	51,000	.73	....	
36,296	52,000	.80	....	
36,994	53,000	.91	....	
37,692	54,000	1.03	....	
38,390	55,000	1.20	....	
39,088	56,000	1.48	....	
39,786	57,000	1.71	....	
40,080	57,420	2.12	....	Tensile strength.
37,200	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.65 = 26.5 per cent.

Elongation of inch sections, ″.30, ″.53*, ″.26, ″.23, ″.23, ″.23, ″.23, ″.21, ″.24, ″.19.

Area at fracture, 1″.19 × ″.34 = .405 square inch.

Contraction, 42.0 per cent.

Appearance of fracture silky, very lamellar.

No. 1279.

½" plate.
Marks, T crosswise.
Sectional area, 1".496 × ".482 = .721 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
721	1,000	0.	0.	Initial load.
3,605	5,000	.0013	....	
7,210	10,000	.0031	0.	
10,815	15,000	.0048	....	
14,420	20,000	.0062	0.	
18,025	25,000	.0085	.0004	
20,400	....	.0104	....	
20,800	28,850	.0109	....	Elastic limit.
21,000	....	.0118	....	
21,200	....	.0129	....	
21,400	....	.0135	....	
21,630	30,000	.0171	....	
21,800	....	.0209	....	
22,000	....	.0225	....	
22,351	31,000	.0253	....	
23,072	32,000	.0448	....	
23,793	33,000	{ .0648	....	
		.1050	....	
24,514	34,000	.1623	....	
25,235	35,000	.1638	....	Immediate elongation.
....	....	.1667	....	After ½ minute.
....	....	.1685	....	After 1 minute.
....	....	.1698	....	After 1½ minutes.
....	....	.1701	....	After 2 minutes.
....	....	.1709	....	After 2½ minutes.
....	....	.1711	....	After 3 minutes.
....	....	.1714	....	After 3½ minutes.
....	....	.1716	....	After 4 minutes.
....	....	.1719	....	After 4½ minutes.
....	....	.1720	....	After 5 minutes.
25,956	36,000	.1780	....	Immediate elongation.
....	....	.1812	....	After ½ minute.
....	....	.1831	....	After 1 minute.
....	....	.1842	....	After 1½ minutes.
....	....	.1852	....	After 2 minutes.
....	....	.1856	....	After 2½ minutes.
....	....	.1862	....	After 3 minutes.
....	....	.1864	....	After 3½ minutes.
....	....	.1866	....	After 4 minutes.
....	....	.1668	....	After 4½ minutes.
....	....	.1870	....	After 5 minutes.
26,677	37,000	.1938	....	
27,398	38,000	.2180	....	
28,119	39,000	.2300	....	
28,840	40,000	.2480	....	Immediate elongation.
....	....	.2600	....	After ½ minute.
....	....	.2620	....	After 1 minute.
....	....	.2632	....	After 1½ minutes.
....	....	.2642	....	After 2 minutes.
....	....	.2649	....	After 2½ minutes.
....	....	.2650	....	After 3 minutes.
....	....	.2657	....	After 3½ minutes.
....	....	.2658	....	After 4 minutes.
....	....	.2659	....	After 4½ minutes.
....	....	.2660	....	After 5 minutes.
29,561	41,000	.2678	....	Immediate elongation.
....	....	.2718	....	After ½ minute.
....	....	.2775	....	After 1 minute.
....	....	.2808	....	After 1½ minutes.
....	....	.2825	....	After 2 minutes.
....	....	.2838	....	After 2½ minutes.
....	....	.2850	....	After 3 minutes.
....	....	.2868	....	After 3½ minutes.
....	....	.2872	....	After 4 minutes.
....	....	.2877	....	After 4½ minutes.
....	....	.2880	....	After 5 minutes.
....	....	.2888	....	After 6 minutes.
....	....	.2893	....	After 7 minutes.
....	....	.2895	....	After 8 minutes.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
....	....	.2899	....	After 9 minutes.
....	....	.2900	....	After 10 minutes.
30,282	42,000	.2912	....	
31,003	43,000	.3265	....	
31,724	44,000	.351	....	
32,445	45,000	.377	....	
33,166	46,000	.424	....	
33,887	47,000	.46	....	
34,608	48,000	.50	....	
35,329	49,000	.56	....	
36,050	50,000	.61	....	
36,771	51,000	.66	....	
37,492	52,000	.73	....	
38,213	53,000	.80	....	
38,934	54,000	.89	....	
39,655	55,000	1.00	....	
40,376	56,000	1.12	....	
41,097	57,000	1.34	....	
41,818	58,000	1.69	....	
41,960	58,200	1.92	....	Tensile strength.
34,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.49 = 24.9 per cent.

Elongation of inch sections, ″.19, ″.15, ″.16, ″.17, ″.19, ″.21, ″.20, ″.25, ″.64*, ″.33.

Area at fracture, 1″.06 × ″.32 = .339 square inch.

Contraction, 53.0 per cent.

Appearance of fracture silky.

No. 1280.

½" plate.
Marks, U crosswise.
Sectional area, 1".498 × ".484 = .725 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
725	1,000	.0	0.	Initial load.
3,625	5,000	.0019	....	
7,250	10,000	.0037	0.	
10,875	15,000	.0058	....	
14,500	20,000	.0078	0.	
18,125	25,000	.0102	0.	
20,000	....	.0116	....	
20,400	....	.0119	....	
20,800	....	.0122	....	
21,200	....	.0126	....	
21,600	....	.0131	....	
21,750	30,000	.0133	.0014	
22,000	....	.0137	....	
22,400	30,900	.0143	....	Elastic limit.
22,800	....	.0166	....	
23,200	32,000	.0207	....	
23,925	33,000	.0290	....	
24,650	34,000	.0392	....	
25,375	35,000	.093	....	
26,100	36,000	.193	....	
26,825	37,000	.235	....	
27,550	38,000	.252	....	
28,275	39,000	.268	....	
29,000	40,000	.290	....	
29,725	41,000	.318	....	
30,450	42,000	.339	....	
31,175	43,000	.374	....	
31,900	44,000	.397	....	
32,625	45,000	.427	....	
33,350	46,000	.46	....	
34,075	47,000	.52	....	
34,800	48,000	.56	....	
35,525	49,000	.61	....	
36,250	50,000	.67	....	
36,975	51,000	.72	....	
37,700	52,000	.80	....	
38,425	53,000	.90	....	
39,150	54,000	1.01	....	
39,875	55,000	1.19	....	
40,600	56,000	1.36	....	
41,325	57,000	1.61	....	
41,620	57,410	2.03	....	Tensile strength.
38,000	....	....	....	Load at time of fracture.

Elongation, after fracture, 2".71 = 27.1 per cent.

Elongation of inch sections, ".13, ".18, ".19, ".22, ".32, ".57*, ".29, ".34, ".27 ".20.

Area at fracture, 1".13 × ".35 = .396 square inch.

Contraction, 45.4 per cent.

Appearance of fracture silky, slight lamination.

No. 1281.

½″ plate.
Marks, R lengthwise.
Sectional area, 1″.497 × ″.488 = .731 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
731	1,000	0.	0.	Initial load.
3,655	5,000	.0021	....	
7,310	10,000	.0044	.0001	
10,965	15,000	.0067	....	
14,620	20,000	.0087	.0002	
18,275	25,000	.0112	.0008	
20,000	....	.0140	....	
20,400	....	.0147	....	
20,800	....	.0157	....	
21,200	....	.0167	....	
21,600	....	.0177	....	
21,930	30,000	.0187	.0068	
22,000	30,100	.0193	....	Elastic limit.
22,400	....	.0208	....	
22,800	....	.0242	....	
23,200	....	.0309	....	
23,392	32,000	.0350	....	
24,123	33,000	100	....	
24,854	34,000	.142	....	
25,585	35,000	.178	....	
26,316	36,000	.187	....	
27,047	37,000	.203	....	
27,778	38,000	.228	....	
28,509	39,000	.244	....	
29,240	40,000	.261	....	
29,971	41,000	.292	....	
30,702	42,000	.313	....	
31,433	43,000	.337	....	
32,164	44,000	.371	....	
32,898	45,000	.393	....	
33,626	46,000	.441	....	
34,357	47,000	.48	....	
35,088	48,000	.52	....	
35,819	49,000	.56*	....	
36,550	50,000	.61	....	
37,281	51,000	.66	....	
38,012	52,000	.73	....	
38,743	53,004	.82	....	
39,474	54,000	.91	....	
40,205	55,000	1.02	....	
40,936	56,000	1.19	....	
41,667	57,000	1.46	....	
41,800	57,180	1.68	....	Tensile strength.
34,300	....	....	....	Load at time of fracture.

Elongation after fracture, 2.13 = 21.3 per cent.

Elongation of inch sections, ″.20, ″.62,* ″.39, ″.20, 17″.13, ″.11, ″.11, ″.10, ″.10.

Area at fracture, 1″.06 × ″.32 = .339 square inch.

Contraction, 53.6 per cent.

Appearance of fracture fine, silky.

No. 1282.

½″ plate.
Marks, S lengthwise.
Sectional area, 1.″496 × ″.470 = .703 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
703	1,000	0.	0.	Initial load.
3,515	5,000	.0018	....	
7,030	10,000	.0037	0.	
10,545	15,000	.0058	....	
14,060	20,000	.0076	0.	
17,575	25,000	.0096	0.	
21,090	30,000	.0114	.0003	
23,400	....	.0126	....	
23,800	....	.0132	....	
24,200	....	.0135	....	
24,600	34,990	.0138	....	Elastic limit.
25,000	....	.0147	....	
25,400	....	.0178	....	
25,800	....	.0232	....	
26,011	37,000	.0402	....	
26,714	38,000	.0651	....	
27,417	39,000	.133	....	
28,120	40,000	.270	....	
28,823	41,000	.285	....	
29,526	42,000	.306	....	
30,229	43,000	.324	....	
30,932	44,000	.353	....	
31,635	45,000	.378	....	
32,338	46,000	.419	....	
33,041	47,000	.45	....	
33,744	48,000	.50	....	
34,447	49,000	.54	....	
35,150	50,000	.60	....	
35,853	51,000	.64	....	
36,556	52,000	.70	....	
37,259	53,000	.78	....	
37,962	54,000	.86	....	
38,665	55,000	.92	....	
39,368	56,000	1.06	....	
40,071	57,000	1.22	....	
40,774	58,000	1.42	....	
41,477	59,000	1.83	....	
41,510	59,050	2.08	....	Tensile strength.
34,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2.60 = 26.0 per cent.

Elongation of inch sections, ″.24, ″.73*, ″.27, ″.23, ″.21, ″.21, ″.20, ″.17, ″.18, ″.16.

Area at fracture, 1″.04 × ″.30 = .377 square inch.

Contraction, 46.4 per cent.

Appearance of fracture silky, lamellar.

No. 1283.

½″ plate.
Marks, T lengthwise.
Sectional area, 1″.498 × ″.480 = .719 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
719	1,000	0.	0.	Initial load.
3,595	5,000	.0022	....	
7,190	10,000	.0045	0.	
10,785	15,000	.0068	....	
14,380	20,000	.0088	0.	
17,975	25,000	.0108	.0002	
21,570	30,000	.0145	.0019	
21,800	....	.0147	....	
22,000	....	.0151	....	
22,200	....	.0153	....	
22,400	....	.0155	....	
22,600	....	.0157	....	
22,800	....	.0161	....	
23,000	....	.0166	....	
23,200	32,270	.0172	....	Elastic limit.
23,400	....	.0180	....	
23,600	....	.0187	....	
23,800	....	.0193	....	
24,000	....	.0203	....	
24,200	....	.0285	....	
24,400	....	.0384	....	
24,600	....	.0149	....	
24,800	....	.0530	....	
25,000	....	.0602	....	
25,165	35,000	.0668	....	
25,884	36,000	.132	....	
26,603	37,000	.208	....	
27,322	38,000	.208	....	
28,041	39,000	.223	....	
28,760	40,000	.238	....	
29,479	41,000	.261	....	
30,198	42,000	.282	....	
30,917	43,000	.302	....	
31,636	44,000	.324	....	
32,355	45,000	.355	....	
33,074	46,000	.385	....	
33,793	47,000	.415	....	
34,512	48,000	.44	....	
35,231	49,000	.50	....	
35,950	50,000	.52	....	
36,669	51,000	.58	....	
37,388	52,000	.63	....	
38,107	53,000	.70	....	
38,826	54,000	.75	....	
39,545	55,000	.82	....	
40,264	56,000	.92	....	
40,983	57,000	1.02	....	
41,702	58,000	1.22	....	
42,421	59,000	1.40	....	
43,140	60,000	1.78 1.98	....	Tensile strength.
38,100	....	....	....	Load at time of fracture.

Elongation after fracture, ″2.47 = 24.7 per cent.

Elongation of inch sections, ″.30, ″.59*, ″.22, ″.20, ″.21, ″.20, ″.18, ″.18, ″.20, ″.19.

Area at fracture, 1″.10 × ″.34 = .374 square inch.

Contraction, 48.0 per cent.

Appearance of fracture fine silky.

No. 1284.

½ plate.
Marks, U lengthwise.
Sectional area, 1″.496 × ″.483 = .723 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
723	1,000	0.	0.	Initial load.
3,615	5,000	.0020	....	
7,230	10,000	.0041	0.	
10,845	15,000	.0064	....	
14,460	20,000	.0084	.0001	
18,075	25,000	.0106	.0003	
21,000	29,050	.0131	....	Elastic limit.
21,400	....	.0143	....	
21,690	30,000	.0207	.0084	
22,000	....	.0217	....	
22,413	31,000	.0247	....	
22,800	....	.0283	....	
23,136	32,000	.0321	....	
23,859	33,000	.0540	....	
24,582	34,000	.105	....	
25,305	35,000	.180	....	
26,028	36,000	.192	....	
26,751	37,000	.210	....	
27,474	38,000	.225	....	
28,197	39,000	.246	....	
28,920	40,000	.272	....	
29,643	41,000	.292	....	
30,366	42,000	.317	....	
31,089	43,000	.349	....	
31,812	44,000	.372	....	
32,535	45,000	.407	....	
33,258	46,000	.43	....	
33,981	47,000	.49	....	
34,704	48,000	.51	....	
35,427	49,000	.57	....	
36,150	50,000	.61	....	
36,873	51,000	.69	....	
37,596	52,000	.75	....	
38,319	53,000	.82	....	
39,042	54,000	.92	....	
39,765	55,000	1.08	....	
40,488	56,000	1.21	....	
41,211	57,000	1.43	....	
41,934	58,000	1.87	....	Tensile strength.
34,900	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.46 = 24.6 per cent.

Elongation of inch sections, ″.45,* ″.48,* ″.21, ″.20, ″.19, ″.18, ″.20, ″.19, ″.18, ″.18.

Area at fracture, 1″.08 × ″.32 = .346 square inch.

Contraction, 52.1 per cent.

Appearance of fracture fine, silky, slight lamination.

No. 1285.

⅝″ plate.
Marks, V lengthwise.
Sectional area, 1″.497 × ″.622 = ″.931 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set,	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
931	1,000	0.	0.	Initial load.
4,655	5,000	.0019	....	
9,310	10,000	.0039	0.	
13,965	15,000	.0058	....	
18,620	20,000	.0077	— .0001	
23,275	25,000	.0097	0.	
26,600	....	.0125	....	
26,800	28,790	.0127	....	Elastic limit.
27,000	....	.0130 .0162	....	
27,400	....	.0188	....	
27,930	30,000	.0268	.0133	
28,400	....	.0310	....	
28,861	31,000	.0368	....	
29,792	32,000	.0612	....	
30,723	33,000	.188	....	
31,654	34,000	.198	....	
32,585	35,000	.217	....	
33,516	36,000	.240	....	
34,447	37,000	.259	....	
35,378	38,000	.288	....	
36,309	39,000	.309	....	
37,240	40,000	.338	....	
38,171	41,000	.367	....	
39,102	42,000	.399	....	
40,033	43,000	.42	....	
40,964	44,000	.48	....	
41,895	45,000	.52	....	
42,826	46,000	.56	....	
43,757	47,000	.61	....	
44,688	48,000	.68	....	
45,619	49,000	.76	....	
46,550	50,000	.86	....	
47,481	51,000	.96	....	
48,412	52,000	1.08	....	
49,343	53,000	1.25	....	
50,274	54,000	1.48	....	
51,205	55,000	2.07	....	Tensile strength.
42,900	....	....	....	Load at time of rupture.

Elongation after fracture, 3″.11 = 31.1 per cent.

Elongation of inch sections, ″.21, ″.28, ″.29, ″.31, ″.28, ″.25, ″.68,* ″.39, ″.24, ″.18.

Area at fracture, 1″.06 × ″.39 = ″.413 square inch.

Contraction, 55.7.

Appearance of fracture silky, lamellar.

No. 1286.

⅝″ plate.
Marks, W lengthwise.
Sectional area, 1″.498 × ″.610 = .914 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
914	1,000	0.	0.	Initial load.
4,570	5,000	.0019	....	
9,140	10,000	.0038	0.	
13,710	15,000	.0058	....	
18,280	20,000	.0078	0.	
22,850	25,000	.0097	0.	
27,000	29,540	.0117	....	Elastic limit.
27,420	30,000	.0125	.0012	
27,800	....	.0235	....	
28,200	....	.0320	....	
28,324	31,000	.0354	....	
28,600	....	.0472	....	
29,000	....	.0351	....	
29,248	32,000	.129	....	
30,162	33,000	.149	....	
31,076	34,000	.160	....	
31,990	35,000	.179	....	
32,904	36,000	.169	....	
33,818	37,000	.210	....	
34,732	38,000	.227	....	
35,646	39,000	.244	....	
36,500	40,000	.275	....	
37,474	41,000	.293	....	
38,388	42,000	.328	....	
39,302	43,000	.341	....	
40,216	44,000	.378	....	
41,130	45,000	.399	....	
42,044	46,000	.46	....	
42,958	47,000	.50	....	
43,872	48,000	.53	....	
44,786	49,000	.58	....	
45,700	50,000	.62	....	
46,614	51,000	.70	....	
47,528	52,000	.75	....	
48,442	53,000	.82	....	
49,356	54,000	.95	....	
50,270	55,000	1.09	....	
51,184	56,000	1.28	....	
52,098	57,000	1.59	....	
52,360	57,290	1.88	....	Tensile strength.
52,200	....	2.01	....	
52,000	....	2.10	....	
51,000	....	2.22	....	
50,000	....	2.29	....	
46,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.36=23.6 per cent.
Elongation of inch sections, ″.15, ″.16, ″.15, ″.17, ″21, ″.25, ″.31, ″.51*, ″.27, ″.18.
Area at fracture, 1″.22 × ″.48 = .586 square inch.
Contraction, 35.9 per cent.
Appearance of fracture silky, stratified.

No. 1287.

⅝″ plate.
Marks, X lengthwise.
Sectional area, 1″.498 × ″.618 = .926 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
926	1,000	0.	0.	Initial load.
4,630	5,000	.0018	....	
9,260	10,000	.0035	.0001	
13,890	15,000	.0053	....	
18,520	20,000	.0073	.0008	
23,150	25,000	.0103	.0021	
23,600	....	.0112	....	
24,000	....	.0121	....	
24,400	26,350	.0127	....	Elastic limit.
24,800	....	.0172	....	
25,002	27,000	.0189	....	
25,200	....	.0203	....	
25,600	....	.0218	....	
25,928	28,000	.0237	....	
26,400	....	.0258	....	
26,854	29,000	.0297	....	
27,400	....	.0378	....	
27,780	30,000	.0422	....	
28,706	31,000	.115	....	
29,632	32,000	.127	....	
30,558	33,000	.145	....	
31,484	34,000	.162	....	
32,410	35,000	.180	....	
33,336	36,000	.196	....	
34,262	37,000	.216	....	
35,188	38,000	.237	....	
36,114	39,000	.257	....	
37,040	40,000	.285	....	
37,966	41,000	.310	....	
38,892	42,000	.337	....	
39,818	43,000	.366	....	
40,744	44,000	.410	....	
41,670	45,000	.44	....	
42,596	46,000	.50	....	
43,522	47,000	.53	....	
44,448	48,000	.57	....	
45,374	49,000	.64	....	
46,300	50,000	.69	....	
47,226	51,000	.78	....	
48,152	52,000	.83	....	
49,078	53,000	.98	....	
50,004	54,000	1.14	....	
50,930	55,000	1.44	....	
51,800	55,940	1.93	....	Tensile strength.
44,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.61 = 26.1 per cent.

Elongation of inch sections, ″.18, ″22, ″.25, ″.43, ″.54*, ″.25, ″.23, ″.20, ″.15, ″.16.

Area at fracture, 1″.11 × ″.43 = .477 square inch.

Contraction, 48.7 per cent.

Appearance of fracture, very rough surface on one side.

No. 1288.

⅝″ plate.
Marks, V crosswise.
Sectional area, 1″.498×″.624=.935 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
935	1,000	0.	0.	Initial load.
4,675	5,000	.0013	....	
9,350	10,000	.0035	0.	
14,025	15,000	.0056	....	
18,700	20,000	.0076	0.	
23,375	25,000	.0093	0.	
28,050	30,000	.0112	0.	
30,000	....	.0122	....	
30,400	....	.0124	....	
30,800	....	.0125	....	
31,200	....	.0127	....	
31,600	....	.0129	....	
32,000	....	.0132	....	
32,400	34,650	.0134	....	Elastic limit.
32,725	35,000	.0142	.0012	
32,725	35,000	.0152	....	
33,200	....	.0211	....	
33,660	36,000	.0278	....	
34,000	....	.0360	....	
34,595	37,000	.0503	....	
35,530	38,000	.081	....	
36,465	39,000	.220	....	
37,400	40,000	.296	....	
38,335	41,000	.305	....	
39,270	42,000	.332	....	
40,205	43,000	.358	....	
41,140	44,000	.384	....	
42,075	45,000	.419	....	
43,010	46,000	.46	....	
43,945	47,000	.50	....	
44,880	48,000	.53	....	
45,815	49,000	.59	....	
46,750	50,000	.63	....	
47,685	51,000	.71	....	
48,620	52,000	.77	....	
49,555	53,000	.85	....	
50,490	54,000	.96	....	
51,425	55,000	1.07	....	
52,360	56,000	1.25	....	
53,295	57,000	1.49	....	
54,230	58,000	1.89	....	
54,380	58,160	2.13	....	Tensile strength.
47,200	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.87 = 28.7 per cent.

Elongation of inch sections, ″.19, ″.23, ″.22, ″.22, ″.25, ″.25, ″.57*, ″.44, ″.30, ″.20.

Area at fracture, 1″.08×″.42 = .454 square inch.

Contraction, 51.4 per cent.

Appearance of fracture silky, lamellar.

No. 1289.

⅝'' plate.
Marks, W crosswise.
Sectional area, 1''.496 × ''.609 = .911 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
911	1, 000	0.	0.	Initial load.
4, 555	5, 000	.0015	....	
9, 110	10, 000	.0035	0.	
13, 665	15, 000	.0055	....	
18, 220	20, 000	.0074	.0002	
22, 775	25, 000	.0095	.0007	
24, 200	....	.0104	....	
24, 600	....	.0106	....	
25, 000	....	.0111	....	
25, 400	....	.0114	....	
25, 800	....	.0125	....	
26, 200	28, 760	.0131	....	Elastic limit.
26, 600	....	.0155	....	
27, 000	....	.0198	....	
27, 330	30, 000	.0222	.0123	
27, 800	....	.0228	....	
28, 241	31, 000	.0237	....	
28, 600	....	.0240	....	
29, 000	....	.0247	....	
29, 152	32, 000	.0270	....	
29, 400	....	.0300	....	
30, 063	33, 000	.044	....	
30, 974	34, 000	.153	....	
31, 885	35, 000	.171	....	
32, 796	36, 000	.185	....	
33, 707	37, 000	.208	....	
34, 618	38, 000	.226	....	
35, 529	39, 000	.252	....	
36, 440	40, 000	.277	....	
37, 351	41, 000	.298	....	
38, 262	42, 000	.329	....	
39, 173	43, 000	.360	....	
40, 084	44, 000	.396	....	
40, 995	45, 000	.42	....	
41, 906	46, 000	.48	....	
42, 817	47, 000	.52	....	
43, 728	48, 000	.55	....	
44, 639	49, 000	.60	....	
45, 550	50, 000	.65	....	
46, 461	51, 000	.74	....	
47, 362	52, 000	.84	....	
48, 283	53, 000	.90	....	
49, 194	54, 000	1.03	....	
50, 105	55, 000	1.17	....	
51, 016	56, 000	1.41	....	
51, 810	56, 870	1.93	....	Tensile strength.

Elongation after fracture, 2''.38 = 23.8 per cent.

Elongation of inch sections, ''.18, ''.19, ''.17, ''.17, ''.21, ''.28, ''.52*, ''.24, ''.23, ''.19.

Area at fracture, 1''.21 × ''.45 = .544 square inch.

Contraction, 40.3 per cent.

Appearance of fracture silky, slight lamination.

No. 1290.

⅝″ plate.
Marks, X crosswise.
Sectional area, 1″.496 × ″.619 = .925 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
925	1,000	0.	0.	Initial load.
4,625	5,000	.0015	....	
9,250	10,000	.0035	0.	
13,875	15,000	.0055	....	
18,500	20,000	.0075	0.	
23,125	25,000	.0097	.0007	
25,600	....	.0114	....	
26,000	....	.0121	....	
26,400	....	.0126	....	
26,800	28,970	.0131	....	Elastic limit.
27,200	....	.0161	....	
27,600	....	.0231	....	
27,750	30,000	.0253	.0137	
28,200	....	.0280	....	
28,675	31,000	.0332	....	
29,600	32,000	.0531	....	
30,525	33,000	.130	....	
31,450	34,000	.155	....	
32,375	35,000	.178	....	
33,300	36,000	.192	....	
34,225	37.000	.213	....	
35,150	38,000	.237	....	
36,075	39,000	.263	....	
37,000	40,000	.285	....	
37,925	41,000	.292	....	
38,850	42,000	.336	....	
39,775	43,000	.376	....	
40,700	44,000	.409	....	
41,625	45,000	.45	....	
42,550	46,000	.50	....	
43,475	47,000	.55	....	
44,400	48,000	.62	....	
45,325	49,000	.69	....	
46,250	50,000	.77	....	
47,175	51,000	.86	....	
48,100	52,000	.98	....	
49,025	53,000	1.10	....	
49,950	54,000	1.30	....	
50,875	55,000	1.04	....	Tensile strength.
42,400	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.40 = 24.0 per cent.

Elongation of inch sections, ″.20, ″.21, ″.70*, ″.29, ″.22, ″.22, ″.19, ″.16, ″.11, ″.10.

Area at fracture, 1″.05 × ″.40 = .420 square inch.

Contraction, 54.6 per cent.

Appearance of fracture silky, slight lamination.

No. 1291.

¾″ plate.
Marks, Y crosswise.
Sectional area, 1″.497×″.746 =1.117 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,117	1,000	0.	0.	Initial load.
5,585	5,000	.0015	....	
11,170	10,000	.0035	0.	
16,755	15,000	.0054	....	
22,340	20,000	.0072	0.	
27,925	25,000	.0086	.0001	
33,510	30,000	.0106	.0004	
34,000	....	.0110	....	
35,000	....	.0115	....	
36,000	....	.0119	....	
37,000	....	.0124	....	
38,000	....	.0127	....	
38,400	....	....	....	
38,800	....	.0133	....	
39,000	....	.0135	....	
39,400	....	.0137	....	
39,800	....	.0139	....	
40,000	....	.0140	....	
40,400	....	.0143	....	
40,800	....	.0146	....	
41,200	....	.0150	....	
41,600	....	.0156	....	
42,000	37,610	.0162	....	Elastic limit.
42,400	....	.0177	....	
42,800	....	.0250	....	
43,200	....	.0355	....	
43,563	39,000	.0165	....	
44,680	40,000	.057	....	
45,797	41,000	.084	....	
.....	....	.222	....	
46,918	42,000	.240	....	
48,031	43,000	.258	....	
49,148	44,000	.276	....	
50,265	45,000	.293	....	
51,382	46,000	.317	....	
52,499	47,000	.341	....	
53,616	48,000	.364	....	
54,733	49,000	.390	....	
55,850	50,000	.42	....	
56,967	51,000	.46	....	
58,084	52,000	.50	....	
59,201	53,000	.53	....	
60,318	54,000	.57	....	
61,435	55,000	.62	....	
62,552	56,000	.66	....	
63.669	57,000	.72	....	
64,786	58,000	.82	....	
65,903	59,000	.90	....	
67,020	60,000	1.02	....	
68,137	61,000	1.13	....	
69,254	62,000	1.36	....	
70,371	63,000	1.68	....	
71,140	63,690	2.04	....	Tensile strength.
64,400	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.41 = 24.1 per cent.
Elongation of inch sections, ″.17, ″.21, ″.18, ″.19, ″.20, ″.20, ″.26, ″.58*, ″.22.
Area at fracture 1″.14 × ″.54 = .616 square inch.
Contraction, 44.9 per cent.
Appearance of fracture silky, slight lamination.

No. 1292.

¾″ plate.
Marks, Z crosswise.
Sectional area, 1″.496 × ″.763 = 1.141 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,141	1,000	0.	0.	Initial load.
5,705	5,000	.0014	....	
11,410	10,000	.0034	0.	
17,115	15,000	.0054	....	
22,820	20,000	.0073	0.	
28,525	25,000	.0090	0.	
34,230	30,000	.0106	0.	
36,200	....	.0114	....	
36,600	32,080	.0116	....	Elastic limit.
37,000	....	.173	....	
37,653	33,000	.175	....	
38,794	34,000	.185	....	
39,935	35,000	.206	....	
41,076	36,000	.219	....	
42,217	37,000	.239	....	
43,358	38,000	.259	....	
44,499	39,000	.281	....	
45,640	40,000	.304	....	
46,781	41,000	.330	....	
47,922	42,000	.353	....	
49,063	43,000	.375	....	
50,204	44,000	.420	....	
51,345	45,000	.47	....	
52,486	46,000	.50	....	
53,627	47,000	.54	....	
54,768	48,000	.59	....	
55,909	49,000	.68	....	
57,050	50,000	.70	....	
58,191	51,000	.79	....	
59,332	52,000	.84	....	
60,473	53,000	.97	....	
61,614	54,000	1.08	....	
62,755	55,000	1.27	....	
63,896	56,000	1.51	....	
64,670	56,680	2.02	....	Tensile strength.
54,600	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.78 = 27.8 per cent.

Elongation of inch sections, ″.20, ″.24, ″.24, ″.42, ″.63, ″.25, ″.20, ″.21, ″.20, ″.19.

Area at fracture, 1″.09 × ″.50 = .545 square inch.

Contraction, 52.2 per cent.

Appearance of fracture silky.

No. 1293.

¾″ plate.
Marks, Z lengthwise.
Sectional area, 1″.495 × ″.722 = 1.079 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,079	1,000	0.	0.	Initial load.
5,395	5,000	.0018	....	
10,790	10,000	.0031	....	
16,185	15,000	.0048	....	
21,580	20,000	.0064	....	
26,975	25,000	.0085	....	
30,000	27,800	.0105	....	Elastic limit.
30,400	....	.0118	....	
30,800	....	.0147	....	
31,200	....	.0156	....	
31,600	....	.0168	....	
32,000	....	.0185	....	
32,370	30,000	.0196	....	
33,449	31,000	.0225	....	
34,528	32,000	.0242	....	
35,607	33,000	.093	....	
36,686	34,000	.145	....	
37,765	35,000	.162	....	
38,844	36,000	.175	....	
39,925	37,000	.191	....	
41,002	38,000	.205	....	
42,081	39,000	.230	....	
43,160	40,000	.247	....	
44,239	41,000	.267	....	
45,318	42,000	.290	....	
46,397	43,000	.309	....	
47,476	44,000	.343	....	
48,555	45,000	.362	....	
49,634	46,000	.394	....	
50,713	47,000	.43	....	
51,792	48,000	.49	....	
52,871	49,000	.52	....	
53,950	50,000	.57	....	
55,029	51,000	.61	....	
56,108	52,000	.66	....	
57,187	53,000	.73	....	
58,266	54,000	.82	....	
59,345	55,000	.90	....	
60,424	56,000	1.01	....	
61,503	57,000	1.17	....	
62,582	58,000	1.37	....	
63,661	59,000	1.92	....	Tensile strength.
51,100	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.79 = 27.9 per cent.

Elongation of inch sections, ″.21, ″.31, ″.79*, ″.29, ″.25, ″.24, ″.20, ″.19, ″.16, ″.15.

Area at fracture, 1″.03 × ″.47 = .484 square inch.

Contraction, 55.1 per cent.

Appearance of fracture silky.

No. 1294.

¾″ inch plate.
Marks, Y lengthwise.
Sectional area, 1″.498 × ″.728 = 1.090 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,090	4,000	0.	0.	Initial load.
5,450	5,000	.0012	....	
10,900	10,000	.0027	0.	
16,350	15,000	.0045	....	
21,800	20,000	.0062	.0005	
27,250	25,000	.0086	.0014	
29,200	....	.0101	....	
29,000	27,160	.0106	....	Elastic limit.
30,000	....	.0142	....	
30,400	....	.0154	....	
30,800	....	.0175	....	
31,200	....	.0187	....	
31,600	....	.0208	....	
32,000	....	.0228	....	
32,700	30,000	.0260	....	
33,790	31,000	.0348	....	
34,880	32,000	.0540	....	
35,970	33,000	.125	....	
37,060	34,000	.135	....	
38,150	35,000	.148	....	
39,240	36,000	.163	....	
40,330	37,000	.176	....	
41,420	38,000	.194	....	
42,510	39,000	.211	....	
43,600	40,000	.231	....	
44,690	41,000	.251	....	
45,780	42,000	.269	....	
46,870	43,000	.289	....	
47,960	44,000	.316	....	
49,050	45,000	.342	....	
50,140	46,000	.361	....	
51,230	47,000	.394	....	
52,320	48,000	.42	....	
53,410	49,000	.48	....	
54,500	50,000	.50	....	
55,590	51,000	.55	....	
56,680	52,000	.60	....	
57,770	53,000	.64	....	
58,800	54,000	.70	....	
59,950	55,000	.79	....	
61,040	56,000	.84	....	
62,130	57,000	.96	....	
63,220	58,000	1.12	....	
64,310	59,000	1.28	....	
65,400	60,000	1.57	....	
65,860	60,420	2.04	....	Tensile strength.
54,600	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.88 = 28.8 per cent.

Elongation of inch sections, ″.18, ″.21, ″.28, ″.22, ″.46, ″.58*, ″.31, ″.26, ″.21, ″.17.

Area at fracture, 1″.07 × .″49 = .524 square inch.

Contraction, 51.9 per cent.

Appearance of fracture silky, slight lamination.

No. 1295.

¾'' inch plate.
Sectional area, 1''.501 × ''.743 = 1.115 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,115	1,000	0.	0.	Initial load.
5,575	5,000	.0016	0.	
11,150	10,000	.0036	0.	
16,725	15,000	.0056	0.	
22,300	20,000	.0074	0.	
27,875	25,000	.0093	0.	
33,000	....	.0107	....	
33,450	30,000	.0113	.0003	Elastic limit.
33,600	....	.0123	....	
33,800	....	.0355	....	
34,000	....	.0596	....	
34,565	31,000	.0980	....	
35,680	32,000	.1295	....	
36,795	33,000	.1484	....	
37,910	34,000	.1650	....	
39,025	35,000	.1785	....	
40,140	36,000	.1970	....	
41,255	37,000	.2220	....	
42,370	38,000	.25	....	
43,485	39,000	.29	....	
44,600	40,000	.31	....	
45,715	41,000	.34	....	
46,830	42,000	.38	....	
47,945	43,000	.40	....	
49,060	44,000	.44	....	
50,175	45,000	.48	....	
51,290	46,000	.52	....	
52,405	47,000	.54	....	
53,520	48,000	.62	....	
54,635	49,000	.68	....	
55,750	50,000	.74	....	
56,865	51,000	.83	....	
57,980	52,000	.96	....	
59,095	53,000	1.03	....	
60,210	54,000	1.28	....	
61,325	55,000	1.54	....	
61,910	55,520	1.98	....	Tensile strength.

Elongation after fracture, 2''.40 = 24.0 per cent.

Elongation of inch sections, ''.14, ''.17, ''.19, ''.21, .''26, ''.28, ''.37, ''.38*, ''.22, ''.18.

Area at fracture, 1''.22 × ''.58 = .708 square inch.

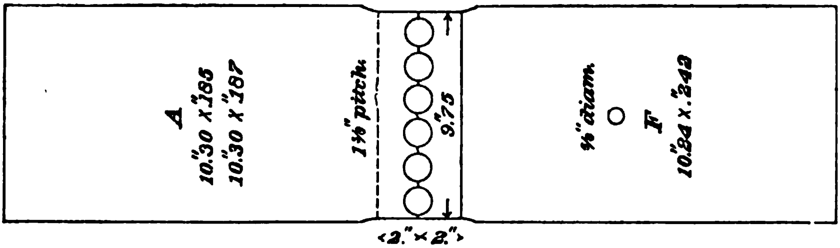
Contraction, 36.5 per cent.

Appearance of fracture silky, stratified.

DETAILS OF TESTS OF RIVETED JOINTS.

No. 1308.

(¼" steel plate.)



(9/16 iron rivets; ⅝ drilled holes; 1⅝" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2.360
Net sectional area of plate	1.452
Bearing surface of rivets	0.908
Shearing area of rivets	3.682

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,360	1,000	0.	0.	Initial load.
4,720	2,000	.0002	....	
7,080	3,000	.0004	....	
9,440	4,000	.0006	....	
11,800	5,000	.0008	.0002	
14,160	6,000	.0010	....	
16,520	7,000	.0012	....	
18,880	8,000	.0015	....	
21,240	9,000	.0018	....	
23,600	10,000	.0021	.0005	
25,960	11,000	.0026	....	
28,320	12,000	.0033	....	
30,680	13,000	.0043	....	
33,040	14,000	.0053	....	
35,400	15,000	.0061	.0034	
37,760	16,000	.0066	....	
40,120	17,000	.0071	....	
42,480	18,000	.0077	....	
44,840	19,000	.0082	....	
47,200	20,000	.0087	.0047	
49,560	21,000	.0092	....	
51,920	22,000	.0097	....	
54,280	23,000	.0102	....	
56,640	24,000	.0108	....	
59,000	25,000	.0116	.0062	
61,360	26,000	.0127	....	
63,720	27,000	.0137	....	
66,080	28,000	.0152	....	
68,440	29,000	.0173	....	
70,800	30,000	.0224	.0152	
73,160	31,000	.0302	....	
75,520	32,000	.0406	....	
77,880	33,000	.0490	....	
80,240	34,000	.0602	....	
82,600	35,000	.0754	.0649	
84,960	36,000	.0936	....	Plate scales.
87,320	37,000	.1123	....	
89,680	38,000	.1400	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
92,040	39,000	.177	....	
94,400	40,000	.21	....	
96,760	41,000	.25	....	
98,400	41,690	.30	....	Tensile strength.
85,000	....	....	....	Load at time of rupture.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	41,690
Tension on net section of plate	67,740
Compression on bearing surface of rivets	108,370
Shearing on rivets	26,720

Fractured plate along line of riveting. Appearance silky, slight lamination.

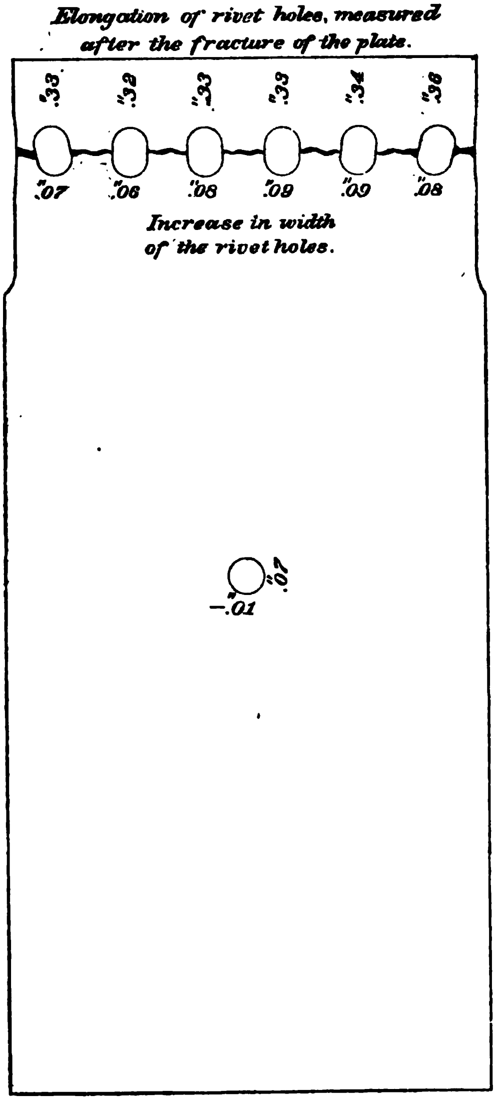
Fractured areas.

Square inch.
".40 × ".18 = .0720
.86 × .16 = .1376
.90 × .19 = .1710
.90 × .19 = .1710
.91 × .19 = .1729
.94 × .19 = .1786
.39 × .16 = .0624

.9655; contraction, 33.5 per cent.

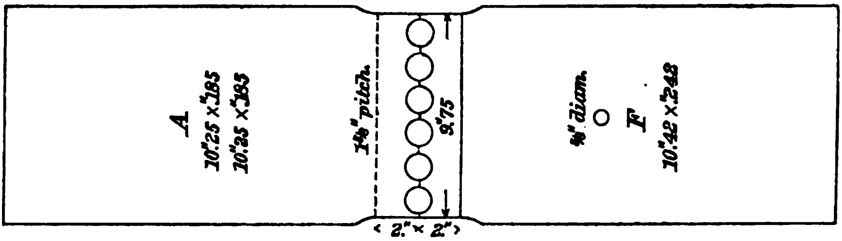
No. 1308.

(¼″ steel plate.)


Elongation of rivet holes, measured after the fracture of the plate.
.33″
.32″
.33″
.33″
.34″
.38″
.07″
.06″
.08″
.09″
.09″
.08″
Increase in width of the rivet holes.
.07″
−.01″

No. 1309.

(¼″ steel plate.)



(9/16″ iron rivets; ⅝″ drilled holes; 1⅝″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2.360
Net sectional area of plate	1 452
Bearing surface of rivets	0.908
Shearing area of rivets	3.682

Applied loads.		In gauged length.		Remarks.
Total	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
99, 550	....	.23	.. ..	Tensile strength. Fractured plate along line of rivet holes. Silky fractures.

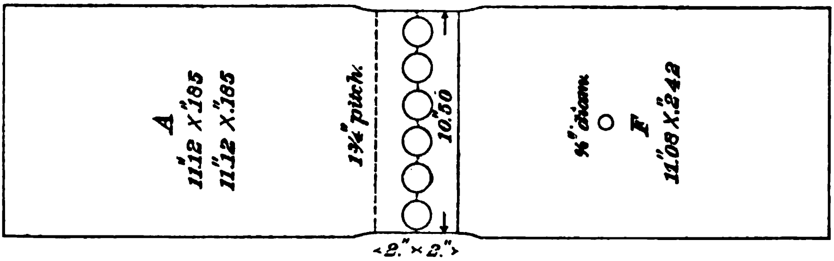
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	42, 180
Tension on net section of plate	68, 560
Compression on bearing surface of rivets	109, 109
Shearing on rivets	27, 040

Fractured plate along line of riveting. Appearance silky. Elongation of rivet holes, ″.34, ″.33, ″.30, ″.33, ″.35, ″.39. Open at edges, ″.05 each.

No. 1310.

(¼″ steel plate.)



(9/16″ iron rivets; ⅝″ drilled holes; 1¾″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.541
Net sectional area of plate	1.634
Bearing surface of rivets	0.907
Shearing area of rivet	3.682

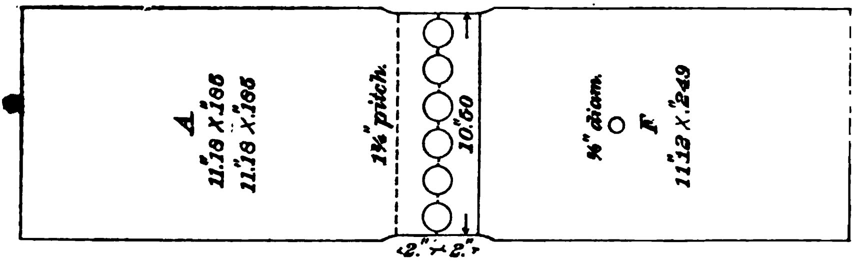
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,541	1,000	0.	0.	Initial load.
5,082	2,000	.0001	....	
7,623	3,000	.0002	....	
10,164	4,000	.0004	....	
12,705	5,000	.0005	0.	
15,246	6,000	.0009	....	
17,787	7,000	.0011	....	
20,328	8,000	.0013	....	
22,869	9,000	.0015	....	
25,410	10,000	.0019	0004	
27,951	11,000	.0025	....	
30,492	12,000	.0028	....	
33,033	13,000	.0049	....	
35,574	14,000	.0060	....	
38,115	15,000	.0065	.0030	
40,656	16,000	.0068	....	
43,197	17,000	.0073	....	
45,738	18,000	.0077	....	
48,279	19,000	.0080	....	
50,820	20,000	.0085	.0048	
53,361	21,000	.0094	....	
55,902	22,000	.0096	....	
58,443	23,000	.0100	....	
60,984	24,000	.0106	....	
63,525	25,000	.0110	.0060	
66,066	26,000	.0125	....	
68,607	27,000	.0135	....	
71,148	28,000	.0144	....	
73,689	29,000	.0155	....	
76,230	30,000	.0169	.0105	
78,771	31,000	.0215	....	
81,312	32,000	.0327	....	
83,853	33,000	.0468	....	
86,394	34,000	.0583	....	
88,935	35,000	.0727	0633	
91,476	36,000	.0903	....	
94,017	37,000	.1090	....	
96,558	38,000	.1365	....	
99,099	39,000	.1630	....	
101,640	40,000	.19	....	
104,181	41,000	.22	....	
106,722	42,000	.25	....	
108,100	42,540	.28	....	Tensile strength.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	42,540
Tension on net section of plate	66,160
Compression on bearing surface of rivets	119,180
Shearing on rivets	29,360

Fractured along line of riveting. Appearance silky.
Elongation of rivet holes, ″.46, ″.44, ″.40, ″.38, ″.40, ″.39.
Open at edges, ″.05 and ″.12.

No. 1311.

(¼″ steel plate.)



(9/16″ iron rivets; ⅝″ drilled holes; 1¾″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.615
Net sectional area of plate	1.681
Bearing surface of rivets	.934
Shearing area of rivets	3.682

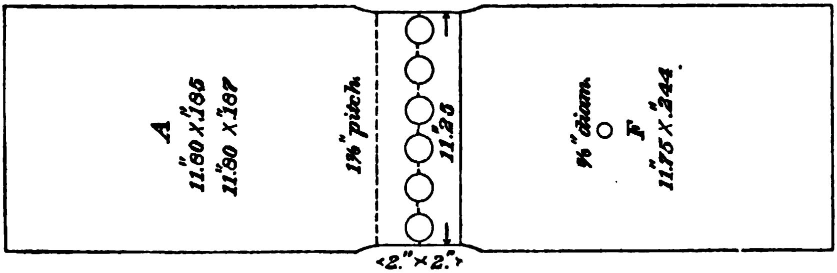
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2, 615	1, 000	0.	0.	Initial load.
5, 230	2, 000	0.		
7, 845	3, 000	.0002		
10, 466	4, 000	.0004		
13, 075	5, 000	.0005	.0004	
15, 690	6, 000	.0007		
18, 305	7, 000	.0010		
20, 920	8, 000	.0012		
23, 535	9, 000	.0015		
26, 150	10, 000	.0017	.0013	
28, 765	11, 000	.0019		
31, 380	12, 000	.0022		
33, 995	13, 000	.0028		
36, 610	14, 000	.0036		
39, 225	15, 000	.0045	.0034	
41, 840	16, 000	.0055		
44, 455	17, 000	.0060		
47, 070	18, 000	.0065		
49, 685	19, 000	.0069		
52, 300	20, 000	.0075	.0055	
54, 915	21, 000	.0084		
57, 530	22, 000	.0087		
60, 145	23, 000	.0091		
62, 760	24, 000	.0095		
65, 375	25, 000	.0102	.0069	
67, 990	26, 000	.0115		
70, 605	27, 000	.0125		
73, 220	28, 000	.0132		
75, 835	29, 000	.0143		
78, 450	30, 000	.0154	.0109	
81, 065	31, 000	.0179		
83, 680	32, 000	.0202		Scale starts off plate.
86, 295	33, 000	.0320		Edges of plate contract opposite line of riveting.
88, 910	34, 000	.0640		
91, 525	35, 000	.0765	.0690	
94, 140	36, 000	.0985		
96, 755	37, 000	.1188		
99, 370	38, 000	.1410		
101, 985	39, 000	.1680		
104, 600	40, 000	.21		
107, 215	41, 000	.25		
109, 830	42, 000	.29		
112, 445	43, 000	.31		
112, 900	43, 170	.35		Tensile strength.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	43, 170
Tension on net section of plate	67, 160
Compression on bearing surface of rivets	119, 810
Shearing on rivets	30, 660

Fractured along line of riveting. Appearance silky.
Elongation of rivet holes, ″.51, ″.44. ″.43, ″.39, ″.41, ″.43.
Open at edges, ″.15 and ″.10.

No. 1312.

(¼″ steel plate.)



($\frac{9}{16}$″ iron rivets; ⅝ drilled holes; 1⅞″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2.745
Net sectional area of plate	1.830
Bearing surface of rivets	.915
Shearing area of rivets	4.281

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,745	1,000	0.	0.	Initial load.
5,490	2,000	.0002		
8,235	3,000	.0005		
10,980	4,000	.0007		
13,725	5,000	.0011	.0008	
16,470	6,000	.0016		
19,215	7,000	.0018		
21,960	8,000	.0021		
24,705	9,000	.0040		
27,450	10,000	.0051	.0040	
30,195	11,000	.0059		
32,940	12,000	.0062		
35,685	13,000	.0067		
38,430	14,000	.0071		
41,175	15,000	.0075	.0055	
43,920	16,000	.0081		
46,665	17,000	.0085		
49,410	18,000	.0091		
52,155	19,000	.0097		
54,900	20,000	.0106	.0073	
57,645	21,000	.0114		
60,390	22,000	.0125		
63,135	23,000	.0133		
65,880	24,000	.0140		
68,625	25,000	.0149	.0101	
71,370	26,000	.0161		
74,115	27,000	.0170		
76,860	28,000	.0184		
79,605	29,000	.0210		
82,350	30,000	.0260	.0197	
85,095	31,000	.0440		Scale starts off, and edges of plate draw down.
87,840	32,000	.0610		
90,585	33,000	.0725		
93,330	34,000	.0870		
96,075	35,000	.1026	.0925	
98,820	36,000	.1218		
101,565	37,000	.1398		
104,310	38,000	.1610		
107,055	39,000	.17		
109,800	40,000	.21		
112,545	41,000	.24		
115,290	42,000	.28		

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
118,035	43,000	.31	....	Tensile strength.
120,780	44,000	.35	....	Load at time of rupture.
123,300	44,920	.45	....	
72,500	....	....	....	

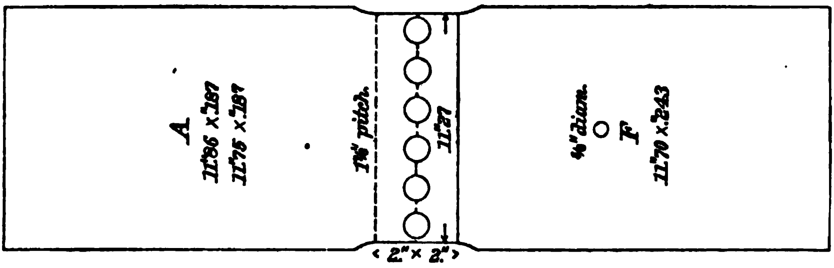
Fractured simultaneously across the line of rivet holes. Appearance silky, slight lamination.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	44,920
Tension on net section of plate	67,380
Compression on bearing surface of rivets	134,730
Shearing on rivets	33,490

Elongation of rivet holes, ".53, ".50, ".49, ".49, ".49, ".53.
Open at edges, ".10 and ".15.

No. 1313.

(¼" steel plate.)



(9/16" iron rivets; ⅝" drilled holes; 1⅞" pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.739
Net sectional area of plate	1.827
Bearing surface of rivets	0.912
Shearing area of rivets	3.682

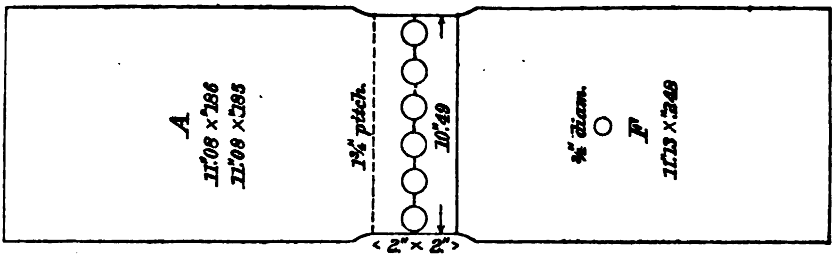
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
121,950	44,520	.52	....	Tensile strength. Fractured across line of rivet holes, commencing at east edge first. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	44,520
Tension on net section of plate	66,750
Compression on bearing surface of rivets	133,720
Shearing on rivets	33,120

Elongation of rivet holes, ".50, ".48, ".44, ".46, ".47, ".49,

No. 1314.

($\frac{1}{4}$″ steel plate.)



($\frac{9}{16}$″ iron rivets; $\frac{3}{4}$″ drilled holes; 1$\frac{3}{4}$″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2.602
Net sectional area of plate	1.486
Bearing surface of rivets	1.116
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
105,909	40,700	.27	....	Tensile strength. Fractured across line of rivet holes, commencing at east edge first. Appearance silky.

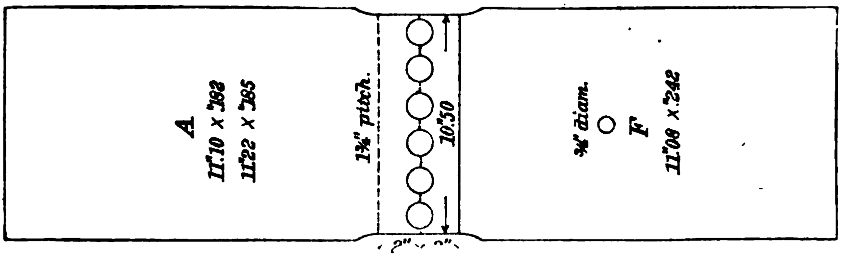
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40,700
Tension on net section of plate	71,270
Compression on bearing surface of rivets	94,890
Shearing on rivets	19,980

Elongation of rivet holes, ″.32, ″.31, ″.30, ″.32, ″.32, ″36.
Open at edges, ″.03 and ″.05.

No. 1315.

($\frac{1}{4}''$ steel plate.)



($\frac{11}{16}''$ iron rivets; $\frac{3}{4}''$ drilled holes; $1\frac{3}{4}'$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.541
Net sectional area of plate	1.452
Bearing surface of rivets	1.089
Shearing area of rivets	5.300

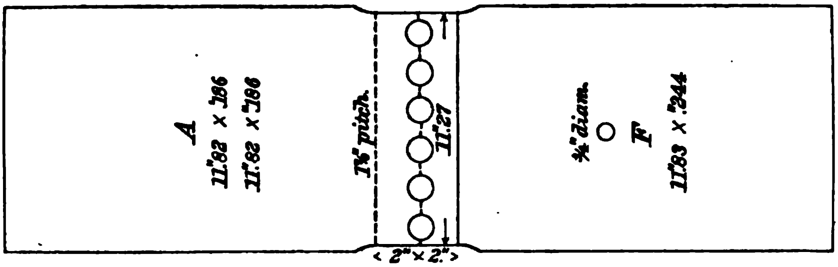
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,541	1,000	0.	0.	Initial load.
5,082	2,000	.0002		
7,623	3,000	.0004		
10,164	4,000	.0006		
12,705	5,000	.0007	0.	
15,246	6,000	.0009		
17,787	7,000	.0012		
20,328	8,000	.0015		
22,869	9,000	.0019		
25,410	10,000	.0027	.0013	
27,951	11,000	.0038		
30,492	12,000	.0047		
33,033	13,000	.0056		
35,574	14,000	.0062		
38,115	15,000	.0068	.0042	
40,656	16,000	.0073		
43,197	17,000	.0078		
45,738	18,000	.0083		
48,279	19,000	.0088		
50,820	20,000	.0094	.0056	
53,361	21,000	.0100		
55,902	22,000	.0107		
58,443	23,000	.0113		
60,984	24,000	.0120		
63,525	25,000	.0128	.0078	
66,066	26,000	.0144		
68,607	27,000	.0153		
71,148	28,000	.0167		
73,689	29,000	.0189		
76,230	30,000	.0221	.0156	
78,771	31,000	.0264		
81,312	32,000	.0328		
83,853	33,000	.0446		
86,394	34,000	.0565		Edges contract.
88,935	35,000	.0710	.0613	
91,476	36,000	.0938		
94,017	37,000	.1137		
96,558	38,000	.13		Scale starts.
99,099	39,000	.17		
101,640	40,000	.24		Tensile strength. All sections fractured at nearly same time.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	40,000
Tension on net section of plate	70,000
Compression on bearing surface of rivets	93,330
Shearing on rivets	19,180

Elongation of rivet holes, ".34, ".34, ".34, ".34, ".32, ".31,
Open at edges ".03 each.

No. 1316.

($\frac{1}{4}''$ steel plate.)



($\frac{11}{16}''$ iron rivets; $\frac{3}{4}''$ drilled holes; $1\frac{7}{8}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.750
Net sectional area of plate	1.652
Bearing surface of rivets	1.098
Shearing area of rivets	5.300

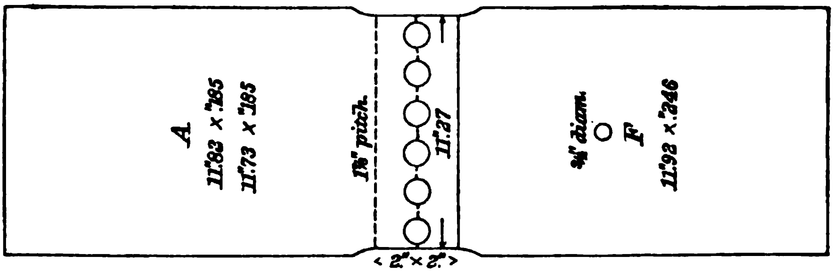
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,750	1,000	0.	0.	Initial load.
5,500	2,000	.0001		
8,250	3,000	.0002		
11,000	4.000	.0002		
13,750	5,000	.0003	0. +	
16,500	6,000	.0004		
19,250	7,000	.0006		
22,000	8,000	.0008		
24,750	9,000	.0012		
27,500	10,000	.0019	.0013	
30,250	11,000	.0031		
33,000	12,000	.0041		
35,750	13,000	.0049		
38,500	14,000	.0054		
41,250	15,000	.0060	.0045	
44,000	16,000	.0065		
46,750	17,000	.0069		
49,500	18,000	.0071		
52,250	19,000	.0076		
55,000	20,000	.0080	.0054	
57,750	21,000	.0086		
60,500	22,000	.0092		
63,250	23,000	.0096		
66,000	24,000	.0104		
68,750	25,000	.0111	.0075	Rested under initial load 15 hours
71,500	26,000	.0130		
74,250	27,000	.0140		
77,000	28,000	.0152		
79,750	29,000	.0165		
82,500	30,000	.0190	.0140	
85,250	31,000	.0233		
88,000	32,000	.0299		
90,750	33,000	.0382		Scale starts and edges contract.
93,500	34,000	.0496		
96,250	35,000	.0648		
99,000	36,000	.0878		
101,750	37,000	.1077		
104,500	38,000	.1398		
107,250	39,000	.16		
110,000	40,000	.20		
112,690	40,980	.24		Tensile strength. Fractured along line of rivet holes. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	40,980
Tension on net section of plate	68,210
Compression on bearing surface of rivets	102,630
Shearing on rivets	21,260

Elongation of rivet holes, ".41, ".39, "37, ".36, ".37, ".39.
Edges open ".10 each.

No. 1317.

($\frac{1}{4}$″ steel plate.)



($\frac{11}{16}$″ iron rivets; $\frac{3}{4}$″ drilled holes; $1\frac{7}{8}$″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.772
Net sectional area of plate	1.665
Bearing surface of rivets	1.107
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,772	1,000	0.	0.	Initial load.
5,544	2,000	.0001	....	
8,316	3,000	.0001	....	
11,088	4,000	.0001	....	
13,860	5,000	.0002	0.	
16,632	6,000	.0002	....	
19,404	7,000	.0003	....	
22,176	8,000	.0005	....	
24,948	9,000	.0007	....	
27,720	10,000	.0011	.0010	
30,492	11,000	.0019	....	
33,264	12,000	.0024	....	
36,036	13,000	.0029	....	
38,808	14,000	.0034	....	
41,580	15,000	.0040	.0034	
44,352	16,000	.0046	....	
47,124	17,000	.0047	....	
49,896	18,000	.0054	....	
52,668	19,000	.0064	....	
55,440	20,000	.0075	.0062	
58,212	21,000	.0083	....	
60,984	22,000	.0092	....	
63,756	23,000	.0097	....	
66,528	24,000	.0105	....	
69,300	25,000	.0113	.0088	
72,072	26,000	.0126	....	
74,844	27,000	.0136	....	
77,616	28,000	.0159	....	
80,388	29,000	.0186	....	
83,160	30,000	.0218	.0176	
85,932	31,000	.0263	....	
88,704	32,000	.0343	....	Scale starts and plate contracts.
91,476	33,000	.0424	....	
94,248	34,000	.0540	....	
97,020	35,000	.0691	....	
99,792	36,000	.0900	....	
102,564	37,000	.1056	....	
105,336	38,000	.1286	....	
108,108	39,000	.1660	....	
110,880	40,000	.20	....	
113,652	41,000	.22	....	
114,850	41,430	.28	....	Tensile strength.

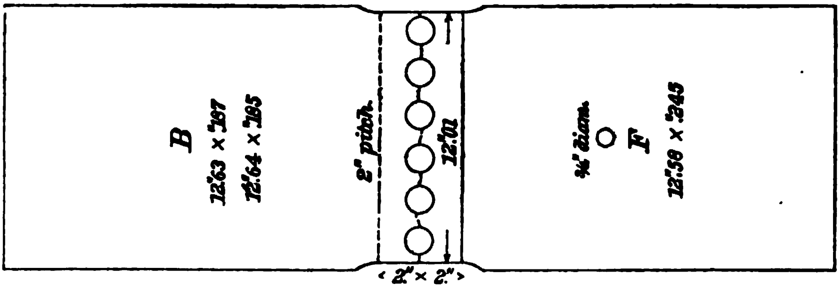
Fractured along line of rivet holes, beginning at west edge. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41,430
Tension on net section of plate	68,960
Compression on bearing surface of rivets	103,750
Shearing on rivets	21,670

Elongation of rivet holes, ″.39, ″.37, ″.35, ″.36, ″.37, ″.37.
Open at edges ″.05 each.

No. 1318.

(¼″ steel plate.)



(11/16″ iron rivets; ¾″ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.942
Net sectional area of plate	1.840
Bearing surface of rivets	1.102
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,942	1,000	0.	0.	Initial load.
5,884	2,000	.0001	....	
8,826	3,000	.0004	....	
11,768	4,000	.0006	....	
14,710	5,000	.0008	.0001	
17,652	6,000	.0010	....	
20,594	7,000	.0013	....	
23,536	8,000	.0016	....	
26,478	9,000	.0021	....	
29,420	10,000	.0030	.0015	
32,362	11,000	.0040	....	
35,304	12,000	.0050	....	
38,246	13,000	.0055	....	
41,188	14,000	.0060	....	
44,130	15,000	.0065	.0040	
47,072	16,000	.0066	....	
50,014	17,000	.0071	....	
52,956	18,000	.0076	....	
55,898	19,000	.0081	....	
58,840	20,000	.0086	.0052	
61,782	21,000	.0095	....	
64,724	22,000	.0100	....	
67,666	23,000	.0105	....	
70,608	24,000	.0111	....	
73,550	25,000	.0121	.0075	
76,492	26,000	.0132	....	
79,434	27,000	.0144	....	
82,376	28,000	.0155	....	
85,318	29,000	.0165	....	
88,260	30,000	.0188	.0121	
91,202	31,000	.0217	....	
94,144	32,000	.0263	....	
97,086	33,000	.0560	....	Scale starts and edges contracts.
100,028	34,000	.0715	....	
102,970	35,000	.0881	.0775	
105,912	36,000	.1090	....	
108,854	37,000	.1272	....	
111,796	38,000	.1584	....	
114,738	39,000	.19	....	
117,680	40,000	.22	....	
120,622	41,000	.28	....	
123,564	42,000	.32	....	
124,100	42,180	.36	....	Tensile strength.

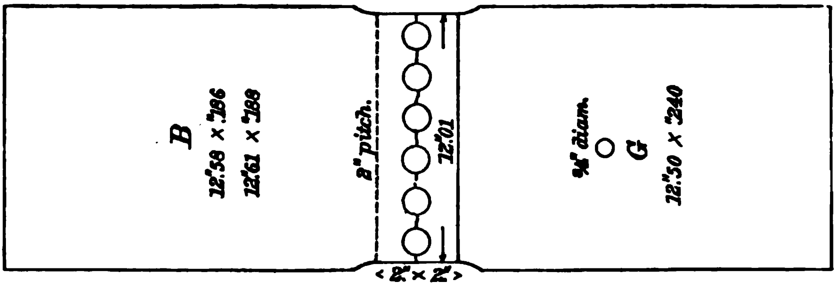
Fractured along line of riveting, beginning at west edge. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	42,180
Tension on net section of plate	67,450
Compression on bearing surface of rivets	112,610
Shearing on rivets	23,420

Elongation of rivet holes, ″.48, ″.45, ″.41, ″.41, ″.14, ″.45.
Open at edges ″.10 each.

No. 1319.

(¼″ steel plate.)



(1 1/16″ iron rivets; ¾″ drilled holes; 2″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2. 882
Net sectional area of plate	1. 802
Bearing surface of rivets	1. 080
Shearing area of rivets	5. 300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
123, 926	43, 000	. 31	....	Tensile strength. Fractured along line of riveting, beginning at west edge. Appearance silky.

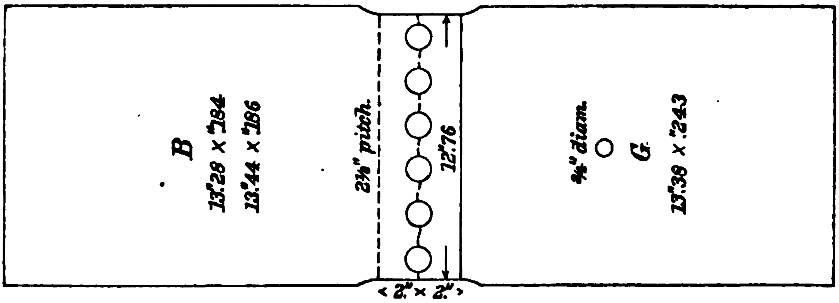
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43, 000
Tension on net section of plate	68, 770
Compression on bearing surface of rivets	114, 750
Shearing on rivets	23, 380

Elongation of rivet holes, ″.55, ″.48, ″.44, ″.40, ″.38, ″.38. Open at edges ″.20 and ″.05.

No. 1320.

(¼" steel plate.)



($\frac{11}{16}$" iron rivets; ¾" drilled holes; 2⅛" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.100
Net sectional area of plate	2.067
Bearing surface of rivets	1.093
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,100	1,000	0.	0.	Initial load.
6,200	2,000	.0001	....	
9,300	3,000	.0002	....	
12,400	4,000	.0003	....	
15,500	5,000	.0005	.0002	
18,600	6,000	.0007	....	
21,700	7,000	.0015	....	
24,800	8,000	.0022	....	
27,900	9,000	.0035	....	
31,000	10,000	.0045	.0033	
34,100	11,000	.0051	....	
37,200	12,000	.0060	....	
40,300	13,000	.0064	....	
43,400	14,000	.0074	....	
46,500	15,000	.0081	.0059	
49,600	16,000	.0087	....	
52,700	17,000	.0092	....	
55,800	18,000	.0098	....	
58,900	19,000	.0108	....	
62,000	20,000	.0115	.0076	
65,100	21,000	.0120	....	
68,200	22,000	.0130	....	
71,300	23,000	.0139	....	
74,400	24,000	.0149	....	
77,500	25,000	.0160	.0110	
80,600	26,000	.0172	....	
83,700	27,000	.0181	....	
86,800	28,000	.0201	....	
89,900	29,000	.0219	....	
93,000	30,000	.0242	.0175	
96,100	31,000	.0306	....	
99,200	32,000	.0495	....	Edges contract.
102,300	33,000	.0617	....	
105,400	34,000	.0730	....	Scale starts.
108,500	35,000	.0885	....	
111,600	36,000	.1075	....	
114,700	37,000	.1230	....	
117,800	38,000	.1480	....	
120,900	39,000	.18	....	
124,000	40,000	.21	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
127,100	41,000	0.24	....	
130,200	42,000	.28	....	
133,300	43,000	.32	....	
133,500	43,060	....	....	Tensile strength.

Fractured along line of riveting, beginning first at west edge. Appearance silky.

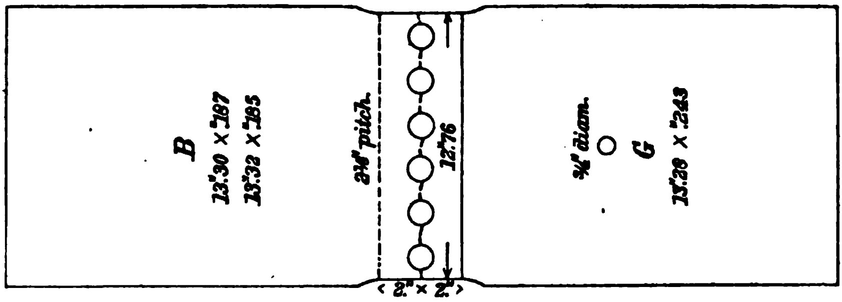
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43,060
Tension on net section of plate	66,520
Compression on bearing surface of rivets	122,140
Shearing on rivets	25,190

Elongation of rivet holes, ″.55, ″.49, ″.47, ″.47 ″.49, ″.54.
Open at edges ″.15 and ″.20.

No. 1321.

(¼″ steel plate.)



(1$\frac{1}{16}$ iron rivets; ¾ drilled holes; 2⅛″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 100
Net sectional area of plate	2. 007
Bearing surface of rivets	1. 098
Shearing area of rivets	5. 300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 100	1, 000	0.	0.	Initial load.
6, 200	2, 000	0.	....	
9, 300	3, 000	.0001	....	
12, 400	4, 000	.0002	....	
15, 500	5, 000	.0004	0.	
18, 600	6, 000	.0002	....	
21, 700	7, 000	.0004	....	
24, 800	8, 000	.0009	....	
27, 900	9, 000	.0015	....	
31, 000	10, 000	.0018	.0017	
34, 100	11, 000	.0021	....	
37, 200	12, 000	.0023	....	
40, 300	13, 000	.0024	....	
43, 400	14, 000	.0025	....	
46, 500	15, 000	.0028	.0024	
49, 600	16, 000	.0037	....	
52, 700	17, 000	.0044	....	
55, 800	18, 000	.0052	....	
58, 900	19, 000	.0062	....	
62, 000	20, 000	.0072	.0054	
65, 100	21, 000	.0080	....	
68, 200	22, 000	.0090	....	
71, 300	23, 000	.0101	....	
74, 400	24, 000	.0110	....	
77, 500	25, 000	.0120	.0087	
80, 600	26, 000	.0137	....	
83, 700	27, 000	.0147	....	
86, 800	28, 000	.0168	....	
89, 900	29, 000	.0188	....	
93, 000	30, 000	.0246	.0187	
96, 100	31, 000	.0370	....	
99, 200	32, 000	.0520	....	Edges contract.
102, 300	33, 000	.0690	....	
105, 400	34, 000	.0850	....	
108, 500	35, 000	.0991	.0887	
111, 600	36, 000	.1148	....	
114, 700	37, 000	.1374	....	
117, 800	38, 000	.16	....	Scale starts.
120, 900	39, 000	.18	....	
124, 000	40, 000	.21	....	

Applied load.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
127, 100	41, 000	.26	....	
130, 200	42, 000	.29	....	
133, 300	43, 000	.33	....	
136, 400	44, 000	.40	....	
136, 500	44, 030	....	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

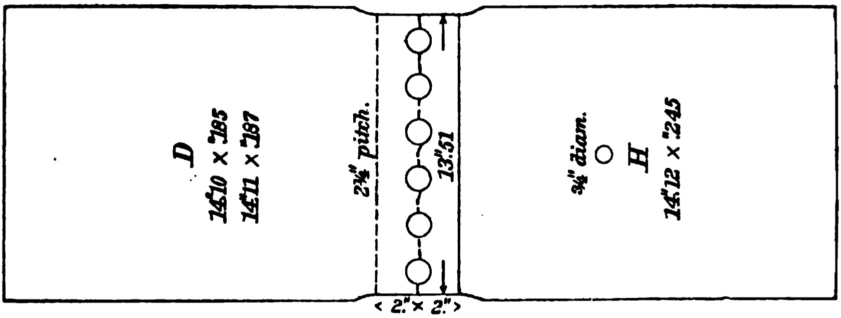
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	44, 030
Tension on net section of plate	68, 000
Compression on bearing surface of rivets	124, 880
Shearing on rivets	25, 750

Elongation of rivet holes, ″.56, ″.51, ″.49, ″.49, ″.54, ″.59.
Open at edges, ″.15 each.

No. 1322.

(¼″ steel plate.)



($\frac{11}{16}$ iron rivets; ¾ drilled holes; 2¼″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.310
Net sectional area of plate	2.207
Bearing surface of rivets	1.103
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 310	1, 000	0.	0.	Initial load.
6, 620	2, 000	.0001	....	
9, 930	3, 000	.0002	....	
13, 240	4, 000	.0003	....	
16, 550	5, 000	.0004	.0001	
19, 860	6, 000	.0005	....	
23, 170	7, 000	.0007	....	

Applied load.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
26,480	8,000	0.0009	....	
29,790	9,000	.0013	....	
33,100	10,000	.0019	0.0016	
36,410	11,000	.0027	....	
39,720	12,000	.0039	....	
43,030	13,000	.0045	....	
46,340	14,000	.0052	....	
49,650	15,000	.0058	.0050	
52,960	16,000	.0065	....	
56,270	17,000	.0067	....	
59,580	18,000	.0071	....	
62,890	19,000	.0074	....	
66,200	20,000	.0080	.0070	
69,510	21,000	.0096	....	
72,820	22,000	.0107	....	
76,130	23,000	.0118	....	
79,440	24,000	.0130	....	
82,750	25,000	.0141	.0113	
86,060	26,000	.0161	....	
89,370	27,000	.0177	....	
92,680	28,000	.0207	....	
95,990	29,000	.0301	....	
99,300	30,000	.0481	.0412	
102,610	31,000	.0661	....	
105,920	32,000	.0828	....	
109,230	33,000	.0975	....	
112,540	34,000	.1170	....	Edges contract.
115,850	35,000	.1402	....	
119,160	36,000	.1655	....	
122,470	37,000	.19	....	
125,780	38,000	.21	....	
129,090	39,000	.26	....	
132,400	40,000	.30	....	
135,710	41,000	.33	....	
139,020	42,000	.39	....	
142,330	43,000	.45	....	
142,450	43,040	....	....	Tensile strength.

Fractured along line of riveting, beginning at east edge. Appearance silky lamellar.

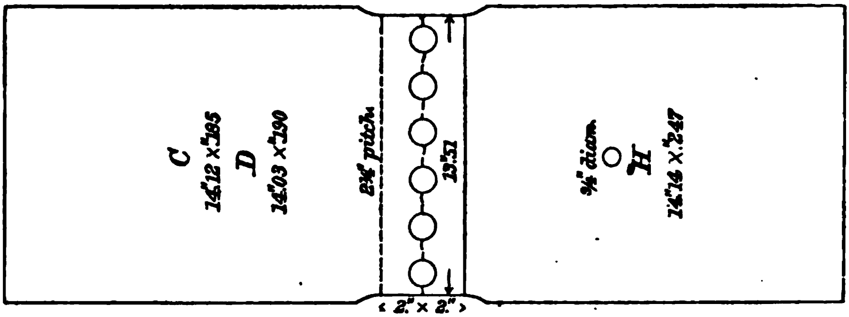
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43,040
Tension on net section of plate	64,540
Compression on bearing surface of rivets	129,150
Shearing on rivets	26,880

Elongation of rivet holes, ″.61, ″.57, ″.58, ″.57, ″.61, ″.64. Open at edges, ″.20 and ″.15.

No. 1323.

($\frac{1}{4}$" steel plate.)



($\frac{11}{16}$ iron rivets; $\frac{3}{4}$ drilled holes; 2¼" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.337
Net sectional area of plate	2.225
Bearing surface of rivets	1.112
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,337	1,000	0.	0.	Initial load.
6,674	2,000	.0000	....	
10,011	3,000	.0001	....	
13,348	4,000	.0001	....	
16,685	5,000	.0002	.0001	
20,022	6,000	.0003	....	
23,359	7,000	.0005	....	
26,696	8,000	.0013	....	
30,033	9,000	.0025	....	
33,370	10,000	.0036	.0033	
36,707	11,000	.0042	....	
40,044	12,000	.0047	....	
43,381	13,000	.0055	....	
46,718	14,000	.0060	....	
50,055	15,000	.0066	.0053	
53,392	16,000	.0078	....	
56,729	17,000	.0080	....	
60,066	18,000	.0087	....	
63,403	19,000	.0097	....	
66,740	20,000	.0109	.0083	
70,077	21,000	.0123	....	
73,414	22,000	.0130	....	
76,751	23,000	.0140	....	
80,088	24,000	.0150	....	
83,425	25,000	.0160	.0118	
86,762	26,000	.0184	....	
90,099	27,000	.0204	....	
93,436	28,000	.0234	....	
96,773	29,000	.0288	....	
100,110	30,000	.0382	.0310	
103,447	31,000	.0560	....	
106,784	32,000	.0695	....	
110,121	33,000	.0875	....	
113,458	34,000	.1035	....	Edges contract.
116,795	35,000	.1221	.1118	
120,132	36,000	.1467	....	
123,469	37,000	.18	....	Scale starts.
126,806	38,000	.20	....	
130,143	39,000	.22	....	

Applied loads.		In gauged lengths.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
133. 480	40, 000	0. 27	....	
136, 817	41, 000	. 32	....	
140. 154	42, 000	. 36	....	
143, 491	43, 000	. 40	....	
146, 180	43, 810	. 45	....	Tensile strength.

Fractured along line of riveting, beginning at the west end. Appearance, silky lamellar.

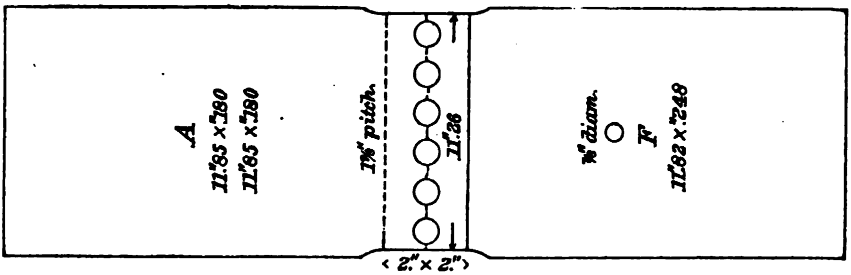
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43, 810
Tension on net section of plate	65, 700
Compression on bearing surface of rivets	131, 460
Shearing on rivets	27, 580

Elongation of rivet holes, ″.61, ″.59, ″.56,, ″.56 ″.60, ″.66.
Open at edges, ″.15 and ″.20.

No. 1324.

(¼″ steel plate.)



(13/16 iron rivets; ⅞″ drilled holes; 1⅞″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2. 792
Net sectional area of plate	1. 490
Bearing surface of rivets	1. 302
Shearing area of rivets	7. 216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2, 792	1, 000	0.	0.	Initial load.
5, 584	2, 000	. 0001	....	
8, 376	3, 000	. 0002	....	
11, 168	4, 000	. 0002+	....	
13, 960	5, 000	. 0003	. 0000	
16, 752	6, 000	. 0004	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
19, 544	7, 000	0. 0005	....	
22, 336	8, 000	.0008	....	
25, 128	9, 000	.0017	....	
27, 920	10, 000	.0026	0. 0019	
30, 712	11, 000	.0036	....	
33, 504	12, 000	.0044	....	
36, 296	13, 000	.0051	....	
39, 088	14, 000	.0060	....	
41, 880	15, 000	.0070	.0054	
44, 672	16, 000	.0080	....	
47, 464	17, 000	.0085	....	
50, 256	18, 000	.0090	....	
53, 048	19, 000	.0094	....	
55, 840	20, 000	.0099	.0069	
58, 632	21, 000	.0106	....	
61, 424	22, 000	.0111	....	
64, 216	23, 000	.0117	....	
67, 008	24, 000	.0127	....	
69, 800	25, 000	.0136	.0091	
72, 592	26, 000	.0153	....	
75, 384	27, 000	.0173	....	
78, 176	28, 000	.0200	....	
80, 968	29, 900	.0236	....	
83, 760	30, 000	.0293	.0230	
86, 552	31, 000	.0364	....	
89, 344	32, 000	.0454	....	
92, 136	33, 000	.0544	....	
94, 928	34, 000	.0665	....	Edges contract, and scale starts.
97, 720	35, 000	.0803	.0712	
100, 512	36, 000	.0992	....	
103, 304	37, 000	.1245	....	
106, 096	38, 000	.1640	....	
107, 900	38, 650	.22	....	Tensile strength.

Fractured along line of riveting, simultaneous fracture in all sections. Appearance, silky, slight lamination.

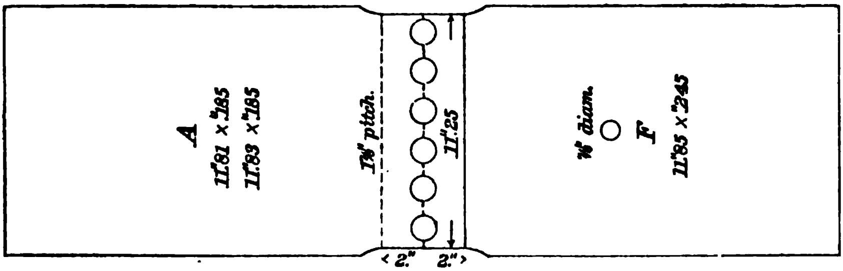
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	38, 650
Tension on net section of plate	72, 480
Compression on bearing surface of rivets	82, 870
Shearing on rivets	14, 950

Elongation of rivet holes, ″.32, ″.31, ″.32, ″.31, ″.30, ″.30.
No opening at edges of plate.

No. 1325.

(¼″ steel plate.)



(13/16 iron rivets; ⅞″ drilled holes; 1⅞″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.756
Net sectional area of plate	1.470
Bearing surface of rivets	1.286
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Sot.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,756	1,000	0.	0.	Initial load.
5,512	2,000	0.	....	
8,268	3,000	0.	....	
11,024	4,000	0.	....	
13,780	5,000	.0001	0.	
16,536	6,000	.0002	....	
19,292	7,000	.0003	....	
22,048	8,000	.0005	....	
24,804	9,000	.0007	....	
27,560	10,000	.0018	.0014	
30,316	11,000	.0021	....	
33,072	12,000	.0028	....	
35,828	13,000	.0035	....	
38,584	14,000	.0043	....	
41,340	15,000	.0050	.0042	
44,096	16,000	.0058	....	
46,852	17,000	.0064	....	
49,608	18,000	.0071	....	
52,364	19,000	.0082	....	
55,120	20,000	.0092	.0076	
57,876	21,000	.0100	....	
60,632	22,000	.0106	....	
63,388	23,000	.0112	....	
66,144	24,000	.0118	....	
68,900	25,000	.0124	.0100	
71,656	26,000	.0135	....	
74,412	27,000	.0145	....	
77,168	28,000	.0162	....	
79,924	29,000	.0189	....	
82,680	30,000	.0219	.0176	
85,436	31,000	.0256	....	
88,192	32,000	.0305	....	
90,948	33,000	.0388	....	
93,704	34,000	.0470	....	
96,460	35,000	.0580	.0513	Edges contract.
99,216	36,000	.0715	....	
101,972	37,000	.0844	....	Scale starts.
104,728	38,000	.1095	....	
107,484	39,000	.1450	....	
108,680	39,430	.20	....	Tensile strength.

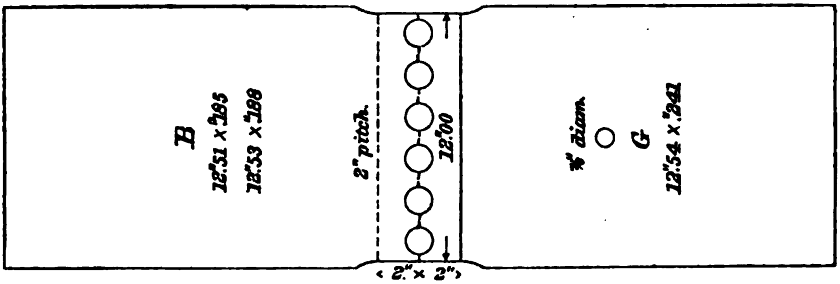
Simultaneous fracture along line of riveting. Appearance, silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,430
Tension on net section of plate	73,930
Compression on bearing surface of rivets	84,510
Shearing on rivets	15,010

Elongation of rivet holes, ″.31, ″.34, ″.32, ″.29, ″.30, ″.27,
No opening at edges of plate.

No. 1326.

(¼" steel plate.)



(1 3/16" rivets; 7/8" drilled holes; 2" pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.892
Net sectional area of plate	1.627
Bearing surface of rivets	1.265
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pound	*Pounds.*	*Inch.*	*Inch.*	
2, 892	1, 000	0.	0.	Initial load.
5, 784	2, 000	.0001	....	
8, 676	3, 000	.0001	....	
11, 568	4, 000	.0002	....	
14, 460	5, 000	.0003	.0001	
17, 352	6, 000	.0004	....	
20, 244	7, 000	.0004	....	
23, 136	8, 000	.0005	....	
26, 028	9, 000	.0014	....	
28, 920	10, 000	.0024	.0018	
31, 812	11, 000	.0034	....	
34, 704	12, 000	.0044	....	
37, 596	13, 000	.0049	....	
40, 488	14, 000	.0057	....	
43, 380	15, 000	.0064	.0043	
46, 272	16, 000	.0072	....	
49, 164	17, 000	.0080	....	
52, 056	18, 000	.0086	....	
54, 948	19, 000	.0094	....	
57, 840	20, 000	.0101	.0067	
60, 732	21, 000	.0112	....	
63, 624	22, 000	.0116	....	
66, 516	23, 000	.0122	....	
69, 408	24, 000	.0129	....	
72, 300	25, 000	.0139	.0089	
75, 192	26, 000	.0159	....	
78, 084	27, 000	.0173	....	
80, 976	28, 000	.0200	....	
83, 868	29, 000	.0232	....	
86, 760	30, 000	.0270	.0205	
89, 652	31, 000	.0325	....	
92, 544	32, 000	.0396	....	
95, 436	33, 000	.0484	....	Scale starts and edges contract.
98, 328	34, 000	.0586	....	
101, 220	35, 000	.0721	.0625	
104, 112	36, 000	.0925	....	
107, 004	37, 000	.1130	....	
109, 896	38, 000	.1431	....	
112, 788	39, 000	.19	....	
115, 680	40, 000	.22	....	
116, 650	40, 340	.29	....	Tensile strength.

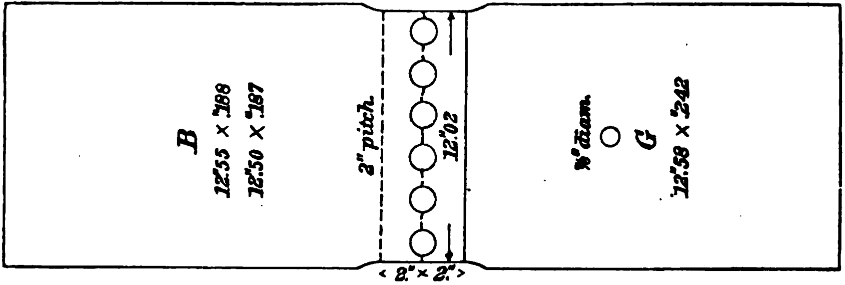
Simultaneous fracture along line of riveting. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	40.340
Tension on net section of plate	71.700
Compression on bearing surface of rivets	92.210
Shearing on rivets	16.170

Elongation of rivet holes, ".38, ".35, ".34, ".33, ".33, ".32,
Open at edges, ".05 and ".03,

No. 1327.

(¼″ steel plate.)



($\frac{13}{16}$ rivets; $\frac{7}{8}$″ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.909
Net sectional area of plate	1.638
Bearing surface of rivets	1.271
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,909	1,000	0.	0.	Initial load.
5,818	2,000	.0002	....	
8,727	3,000	.0004	....	
11,636	4,000	.0006	....	
14,545	5,000	.0008	.0004	
17,454	6,000	.0010	....	
20,363	7,000	.0015	....	
23,272	8,000	.0018	....	
26,181	9,000	.0021	....	
29,090	10,000	.0026	.0015	
31,999	11,000	.0032	....	
34,908	12,000	.0038	....	
37,817	13,000	.0045	....	
40,726	14,000	.0050	....	
43,635	15,000	.0057	.0035	
46,544	16,000	.0062	....	
49,453	17,000	.0069	....	
52,362	18,000	.0075	....	
55,271	19,000	.0080	....	
58,180	20,000	.0085	.0050	
61,089	21,000	.0094	....	
63,998	22,000	.0099	....	
66,907	23,000	.0105	....	
69,816	24,000	.0109	....	
72,725	25,000	.0117	.0070	
75,634	26,000	.0132	....	
78,543	27,000	.0140	....	
81,452	28,000	.0152	....	
84,361	29,000	.0165	....	
87,270	30,000	.0190	0127	
90,179	31,000	.0220	....	
93,088	32,000	.0250	....	
95,997	33,000	.0315	....	
98,906	34,000	.0410	....	
101,815	35,000	.0520	.0437	
104,724	36,000	.0680	....	Edges contract and scale starts:
107,633	37,000	.0846	....	
110,542	38,000	.1065	....	
113,451	39,000	.14	....	
116,360	40,000	.18	....	
119,269	41,000	.21	....	
120,080	41,280	.26	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky.

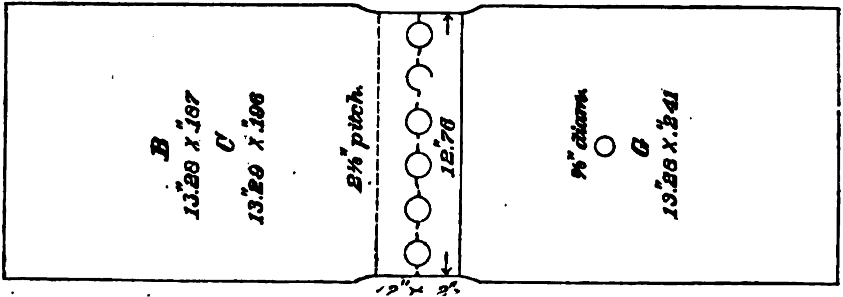
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41,280
Tension on net section of plate	73,310
Compression on bearing surface of rivets	94,480
Shearing on rivets	16,640

Elongation of rivet holes, ″.35, ″.32, ″.32, ″.33, ″32, ″.30.

Open at edges, ″.02 and ″.00.

No. 1328.

($\frac{1}{4}''$ steel plate.)



($1\frac{3}{16}''$ iron rivets; $\frac{7}{8}''$ drilled holes; $2\frac{1}{8}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.075
Net sectional area of plate	1.810
Bearing surface of rivets	1.265
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,075	1,000	0.	0.	Initial load.
6,150	2,000	.0001		
9,225	3,000	.0001		
12,300	4,000	.0002		
15,375	5,000	.0003	.0002	
18,450	6,000	.0012		
21,525	7,000	.0023		
24,600	8,000	.0028		
27,675	9,000	.0036		
30,750	10,000	.0041	.0036	
33,825	11,000	.0047		
36,900	12,000	.0056		
39,975	13,000	.0065		
43,050	14,000	.0072		
46,125	15,000	.0081	.0066	
49,200	16,000	.0089		
52,275	17,000	.0097		
55,350	18,000	.0101		
58,425	19,000	.0107		
61,500	20,000	.0112	.0085	
64,575	21,000	.0123		
67,650	22,000	.0131		
70,725	23,000	.0140		
73,800	24,000	.0148		
76,875	25,000	.0158	.0114	
79,950	26,000	.0174		
83,025	27,000	.0188		
86,100	28,000	.0203		
89,175	29,000	.0216		
92,250	30,000	.0241	.0178	
95,325	31,000	.0257		
98,400	32,000	.0310		
101,475	33,000	.0370		
104,550	34,000	.0460		
107,625	35,000	.0582	.0495	Edges contract and scale starts.
110,700	36,000	.0712		
113,775	37,000	.0836		
116,850	38,000	.1000		
119,925	39,000	.1200		
123,000	40,000	.16		
126,075	41,000	.21		
129,150	42,000	.24		
130,050	42,290			Tensile strength.

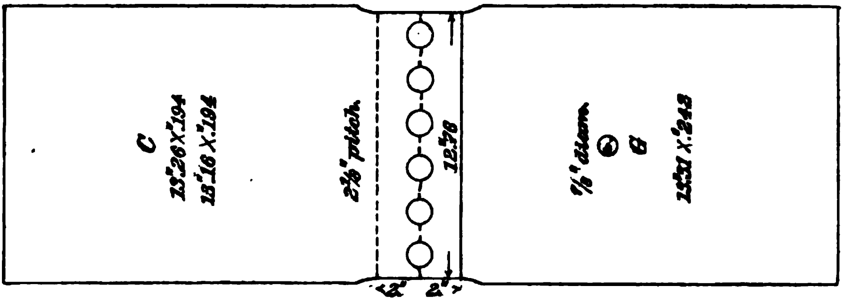
Fractured along line of riveting beginning at west edge. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	42,290
Tension on net section of plate	71,850
Compression on bearing surface of rivets	102,810
Shearing on rivets	18,020

Elongation of rivet holes, ".41, ".41, ".40, ".40, ".40, ".48.
Open at edges, ".05 and ".15.

No. 1329.

(¼" steel plate.)



(13/16" iron rivets; ⅞ drilled holes; 2⅛" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.088
Net sectional area of plate	1.817
Bearing surface of rivets	1.271
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,088	1,000	0.	0.	Initial load.
6,176	2,000	.0001	....	
9,264	3,000	.0002	....	
12,352	4,000	.0003	....	
15,440	5,000	.0004	.0003	
18,528	6,000	.0009	....	
21,616	7,000	.0016	....	
24,704	8,000	.0024	....	
27,792	9,000	.0034	....	
30,880	10,000	.0042	.0036	
33,968	11,000	.0052	....	
37,056	12,000	.0059	....	
40,144	13,000	.0064	....	
43,232	14,000	.0074	....	
46,320	15,000	.0079	.0060	
49,408	16,000	.0088	....	
52,496	17,000	.0096	....	
55,584	18,000	.0104	....	
58,672	19,000	.0108	....	
61,760	20,000	.0114	.0084	
64,848	21,000	.0128	....	
67,936	22,000	.0136	....	
71,024	23,000	.0141	....	
74,112	24,000	.0149	....	
77,200	25,000	.0159	.0113	
80,288	26,000	.0174	....	
83,376	27,000	.0184	....	
86,464	28,000	.0196	....	
89,552	29,000	.0210	....	
92,640	30,000	.0225	.0161	
95,728	31,000	.0265	....	
98,816	32,000	.0316	....	
101,904	33,000	.0406	....	
104,992	34,000	.0515	....	
108,080	35,000	.0675	.0581	
111,168	36,000	.0824	....	
114,256	37,000	.0986	....	

Applied loads.		In gauged lengths.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
117,344	38,000	.1200	....	Scale starts.
120,432	39,000	.14	....	
123,520	40,000	.17	....	
126,608	41,000	.21	....	
129,696	42,000	.25	....	
132,000	42,750	.32	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge.

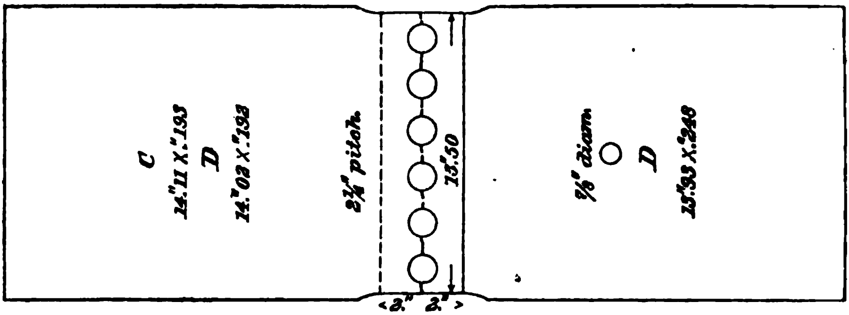
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	42,750
Tension on net section of plate	72,650
Compression on bearing surface of rivets	103,860
Shearing on rivets	18,290

Elongation of rivet holes, ″.40, ″.40, ″.39, ″.43, ″.44, ″.50.
Open at edges, ″.07 and ″.20.

No. 1330.

($\frac{1}{4}$″ steel plate.)



($\frac{13}{16}$″ iron rivets; $\frac{7}{8}$″ drilled holes; 2¼″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.348
Net sectional area of plate	2.046
Bearing surface of rivets	1.302
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,348	1,000	0.	0.	Initial load.
6,696	2,000	.0001	....	
10,044	3,000	.0002	....	
13,392	4,000	.0003	....	
16,740	5,000	.0004	.0003	

Applied loads.		In gauged lengths.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
20,088	6,000	.0006	....	
23,436	7,000	.0009	....	
26,784	8,000	.0013	....	
30,132	9,000	.0017	....	
33,480	10,000	.0020	.0014	
36,828	11,000	.0025	....	
40,176	12,000	.0034	....	
43,524	13,000	.0037	....	
46,872	14,000	.0044	....	
50,220	15,000	.0049	.0032	
53,568	16,000	.0056	....	
56,916	17,000	.0063	....	
60,264	18,000	.0071	....	
63,612	19,000	.0081	....	
66,960	20,000	.0090	.0061	
70,308	21,000	.0101	....	
73,656	22,000	.0106	....	
77,004	23,000	.0114	....	
80,352	24,000	.0121	....	
83,700	25,000	.0127	.0085	
87,048	26,000	.0141	....	
90,396	27,000	.0151	....	
93,744	28,000	.0161	....	
97,092	29,000	.0173	....	
100,440	30,000	.0198	.0139	
103,788	31,000	.0240	....	
107,136	32,000	.0274	....	
110,484	33,000	.0377	....	
113,832	34,000	.0430	....	
117,180	35,000	.0562	.0484	
120,528	36,000	.0810	....	Edges contract.
123,876	37,000	.1040	....	
127,224	38,000	.13	....	Scale starts.
130,573	39,000	.16	....	
133,920	40,000	.19	....	
137,268	41,000	.23	....	
140,616	42,000	.27	....	
143,964	43,000	.34	....	
144,300	43,100	.38	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge; appearance silky.

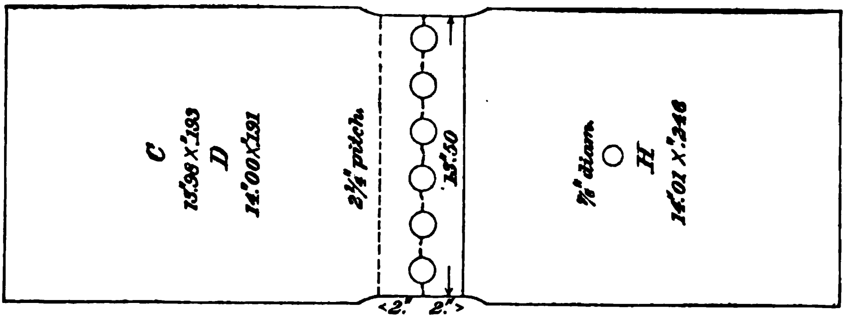
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43,100
Tension on net section of plate	70,530
Compression on bearing surface of rivets	110,830
Shearing on rivets	20,000

Elongation of rivet holes, ″.52, ″.47, ″.44, ″.41, ″.44, ″.44.
Open at edges, ″.12 and ″.07.

No. 1331.

($\frac{1}{4}$'' steel plate.)



($\frac{13}{16}$'' iron rivets; $\frac{7}{8}$'' drilled hole; $2\frac{1}{4}$'' pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.321
Net sectional area of plate	2.029
Bearing surface of rivets	1.291
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,321	1,000	0.	0.	Initial load.
6,642	2,000.	.0001	....	
9,963	3,000	.0002	....	
13,284	4,000	.0003	....	
16,605	5,000	.0004	.0003	
19,926	6,000	.0009	....	
23,247	7,000	0017	....	
26,568	8,000	.0023	....	
29,889	9,000	.0049	....	
33,210	10,000	.0050	.0043	
36,531	11,000	.0060	....	
39,852	12,000	.0070	....	
43,173	13,000	.0076	....	
46,494	14,000	.0084	....	
49,815	15,000	.0094	.0074	
53,136	16,000	.0104	....	
56,457	17,000	.0112	....	
59,778	18,000	.0120	....	
63,099	19,000	.0127	....	
66,420	20,000	.0134	.0100	
69,741	21,000	.0146	....	
73,062	22,000	.0154	....	
76,383	23,000	.0161	....	
79,704	24,000	.0171	....	
83,025	25,000	.0181	.0129	
86,346	26,000	.0200	....	
89,667	27,000	.0213	....	
92,988	28,000	.0227	....	
96,309	29,000	.0244	....	
99,630	30,000	.0267	.0197	
102,951	31,000	.0327	....	
106,272	32,000	.0403	....	
109,593	33,000	.0510	....	
112,914	34,000	.0650	....	Edges contract and scale starts.
116,235	35,000	.0810	.0712	
119,556	36,000	.1040	....	
122,877	37,000	.1265	....	
126,198	38,000	.16	....	
129,519	39,000	.19	....	
132,840	40,000	.23	....	
136,161	41,000	.28	....	
137,651	41,450	.31	....	Tensile strength.

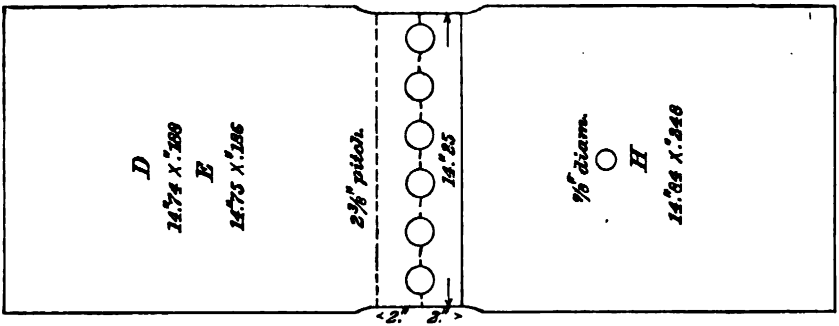
Fractured along line of riveting, beginning at the east edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41.450
Tension on net section of plate	67.840
Compression on bearing surface of rivets	106.620
Shearing on rivets	19.080

Elongation of rivet holes, ''.47, ''.43, ''.41, ''43, ''.41, ''.46.
Open at edges ''.05 and ''.12.

No. 1332.

($\frac{1}{4}$″ steel plate.)



($\frac{13}{16}$″ iron rivets; $\frac{7}{8}$″ drilled holes; $2\frac{3}{8}$″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.534
Net sectional area of plate	2.232
Bearing surface of rivets	1.302
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,534	1,000	0.	0.	Initial load.
7,068	2,000	0.	....	
10,602	3,000	.0001	....	
14,136	4,000	.0002	....	
17,670	5,000	.0002	.0001	
21,204	6,000	.0003	....	
24,738	7,000	.0004	....	
28,272	8,000	.0006	....	
31,806	9,000	.0009	....	
35,340	10,000	.0013	.0011	
38,874	11,000	.0017	....	
42,408	12,000	.0022	....	
45,942	13,000	.0033	....	
49,476	14,000	.0039	....	
53,010	15,000	.0049	.0045	
56,544	16,000	.0062	....	
60,078	17,000	.0071	....	
63,612	18,000	.0077	....	
67,146	19,000	.0082	....	
70,680	20,000	.0091	.0075	
74,214	21,000	.0101	....	
77,748	22,000	.0109	....	
81,282	23,000	.0117	....	
84,816	24,000	.0129	....	
88,350	25,000	.0139	.0112	
91,884	26,000	.0152	....	
95,418	27,000	.0162	....	
98,952	28,000	.0177	....	
102,486	29,000	.0196	....	
106,020	30,000	.0223	.0177	
109,554	31,000	.0311	....	
113,088	32,000	.0460	....	
116,622	33,000	.0640	....	Edges contract and scale starts.
120,156	34,000	.0790	....	
123,690	35,000	.0994	....	
127,224	36,000	.1220	....	
130,758	37,000	.14	....	
134,292	38,000	.17	....	
137,826	39,000	.20	....	
141,360	40,000	.26	....	
144,894	41,000	.30	....	
147,780	41,820	.37	....	Tensile strength

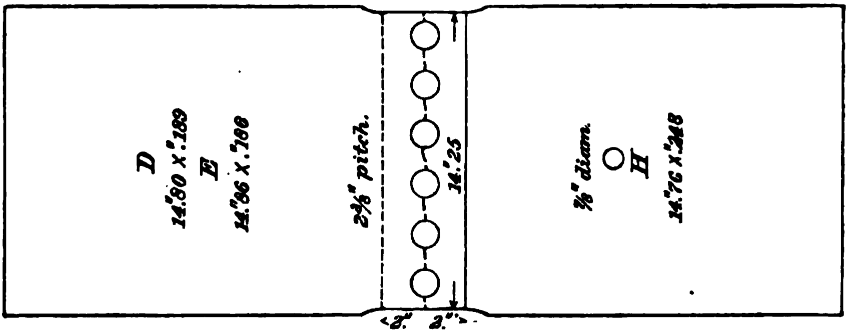
Fractured along line of riveting, beginning at the west edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41,820
Tension on net section of plate	66,210
Compression on bearing surface of rivets	113,500
Shearing on rivets	20,480

Elongation of rivet holes, ″.62, ″.56, ″.52, ″.49, ″.50, ″.52.
Open at edges ″.25 and ″.10.

No. 1333.

(¼" steel plate.)



(1$\frac{3}{16}$" rivet holes; ⅞ drilled holes; 2⅜" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.534
Net sectional area of plate	2.232
Bearing surface of rivets	1.302
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,534	1,000	0.	0.	Initial load.
7,068	2,000	0.	....	
10,602	3,000	.0001	....	
14,136	4,000	.0002	....	
17,670	5,000	.0002	.0001	
21,204	6,000	.0003	....	
24,738	7,000	.0004	....	
28,272	8,000	.0005	....	
31,806	9,000	.0006	....	
35,340	10,000	.0010	.0002	
38,874	11,000	.0018	....	
42,408	12,000	.0023	....	
45,942	13,000	.0033	....	
49,476	14,000	.0042	....	
53,010	15,000	.0051	.0045	
56,544	16,000	.0060	....	
60,078	17,000	.0070	....	
63,612	18,000	.0075	....	
67,146	19,000	.0085	....	
70,680	20,000	.0095	.0080	
74,214	21,000	.0105	....	
77,748	22,000	.0111	....	
81,282	23,000	.0120	....	
84,816	24,000	.0133	....	
88,350	25,000	.0145	.0122	
91,884	26,000	.0165	....	
95,418	27,000	.0177	....	
98,952	28,000	.0190	....	
102,486	29,000	.0210	....	
106,020	30,000	.0238	.0200	
109,554	31,000	.0290	....	
113,088	32,000	.0350	....	
116,622	33,000	.0450	....	
120,156	34,000	.0590	....	
123,690	35,000	.0778	.0710	
127,224	36,000	.1030	....	Edges contract and scale starts.
130,758	37,000	.1220	....	
134,292	38,000	.15	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
137, 826	39, 000	.18	....	
141, 360	40, 000	.21	....	
144, 894	41, 000	.29	....	
148, 428	42, 000	.33	....	
151, 120	42, 760	.42	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge. Appearance silky, slightly lamellar.

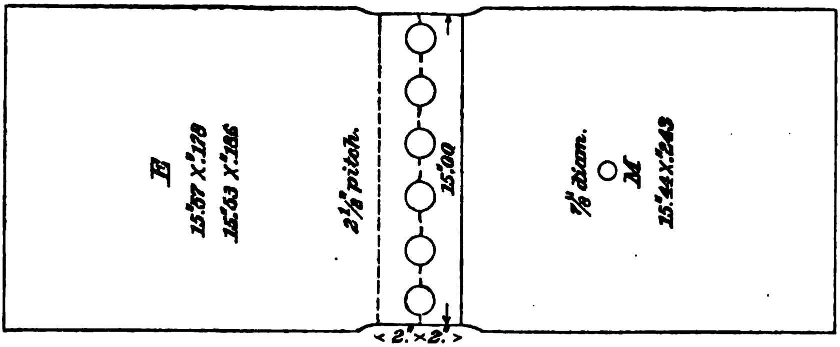
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	42, 760
Tension on net section of plate	67, 710
Compression on bearing surface of rivets	116, 070
Shearing on rivets	20, 940

Elongation of rivet holes, ″.58 ″.56 ″.52 ″.52 ″.56 ″.61.
Open at edges, ″.15 and ″.22.

No. 1334.

(¼″ steel plate.)



(13/16″ iron rivets; ⅞″ drilled holes; 2½″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 643
Net sectional area of plate	2. 369
Bearing surface of rivets	1. 276
Shearing area of rivets	7. 216

Applied loads.		In gauged length.		Remarks
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 645	1, 000	0.	0.	Initial load.
7, 290	2, 000	.0003	....	
10, 935	3, 000	.0005	....	
14, 580	4, 000	.0009	....	

Applied loads.		In guaged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
18,225	5,000	.0014	.007	
21,870	6,000	.0020	....	
25,515	7,000	.0028	....	
29,160	8,000	.0035	....	
32,805	9,000	.0042	....	
36,450	10,000	.0050	.0031	
40,095	11,000	.0059	....	
43,740	12,000	.0066	....	
47,385	13,000	.0073	....	
51,030	14,000	.0079	....	
54,675	15,000	.0087	.0053	
58,320	16,000	.0095	....	
61,965	17,000	.0102	....	
65,610	18,000	.0108	....	
69,255	19,000	.0116	....	
72,900	20,000	.0125	.0080	
76,545	21,000	.0139	....	
80,190	22,000	.0147	....	
83,835	23,000	.0157	....	
87,480	24,000	.0170	....	
91,125	25,000	.0183	.0124	
94,770	26,000	.0204	....	
98,415	27,000	.0219	....	
102,060	28,000	.0239	....	
105,705	29,000	.0258	....	
109,350	30,000	.0293	.0212	
112,995	31,000	.0378	....	
116,640	32,000	.0500	....	
120,285	33,000	.0615	....	
123,930	34,000	.0775	....	Edges contract.
127,575	35,000	.0950	....	
131,220	36,000	.11	....	
134,865	37,000	.14	....	
138,510	38,000	.17	....	Scale starts.
142,155	39,000	.19	....	
145,800	40,000	.21	....	
149,445	41,000	.24	....	
153,090	42,000	.27	....	
156,735	43,000	.34	....	
160,380	44,000	.38	....	
162,750	44,650	.45	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

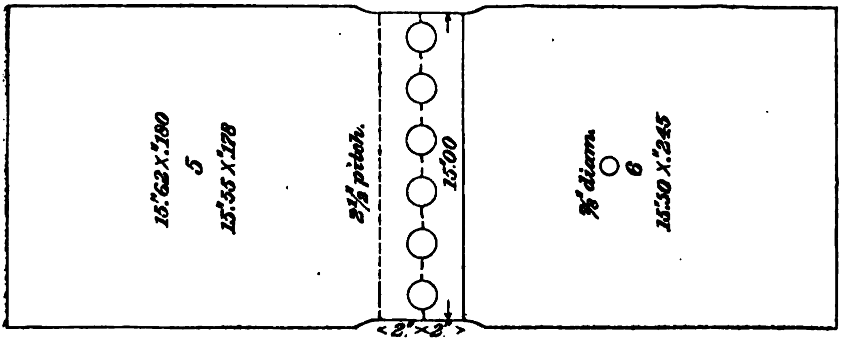
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	44,650
Tension on net section of plate	68,700
Compression on bearing surface of rivets	127,350
Shearing on rivets	22,550

Elongation of rivet holes, ″.60, ″.54, ″.52, ″.52, ″.55, ″.61.
Open at edges, ″.15 and ″.20.

No. 1335.

($\frac{1}{4}''$ steel plate.)



($\frac{13}{16}''$ iron rivets; $\frac{7}{8}''$ drilled holes; $2\frac{1}{2}''$ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.675
Net sectional area of plate	2.589
Bearing surface of rivets	1.286
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,675	1,000	0.	0.	Initial load.
7,350	2,000	.0001	....	
11,025	3,000	.0002	....	
14,700	4,000	.0006	....	
18,375	5,000	.0015	.0012	
22,050	6,000	.0027	....	
25,725	7,000	.0037	....	
29,400	8,000	.0047	....	
33,075	9,000	.0057	....	
36,750	10,000	.0067	.0052	
40,425	11,000	.0075	....	
44,100	12,000	.0082	....	
47,775	13,000	.0092	....	
51,450	14,000	.0102	....	
55,125	15,000	.0112	.0086	
58,800	16,000	.0123	....	
62,475	17,000	.0132	....	
66,150	18,000	.0143	....	
69,825	19,000	.0152	....	
73,500	20,000	.0162	.0119	
77,175	21,000	.0174	....	
80,850	22,000	.0183	....	
84,525	23,000	.0193	....	Remained under load fifteen minutes.
88,200	24,000	.0202	....	
91,875	25,000	.0217	.0157	
95,550	26,000	.0231	....	
99,225	27,000	.0260	....	
102,900	28,000	.0288	....	
106,575	29,000	.0324	....	
110,250	30,000	.0389	.0312	
113,925	31,000	.0515	....	Edges contract.
117,600	32,000	.0644	....	
121,275	33,000	.0820	....	Scale starts.
124,950	34,000	.0995	....	
128,625	35,000	.1230	....	
132,300	36,000	.14	....	
135,975	37,000	.18	....	
139,650	38,000	.20	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
143, 825	39, 000	.22	....	
147, 000	40, 000	.25	....	
150, 675	41, 000	.30	....	
154, 350	42, 000	.35	....	
158, 025	43, 000	.44	....	
158, 220	43, 050	.47	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

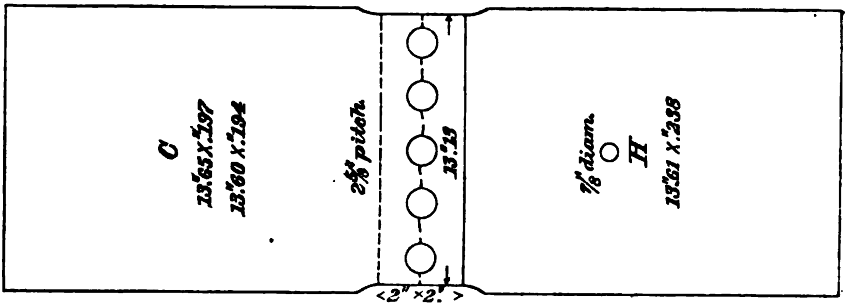
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43, 050
Tension on net section of plate	66, 230
Compression on bearing surface of rivets	123, 030
Shearing on rivets	21, 930

Elongation of rivet holes, ″.57, ″.56, ″.56, ″.57, ″.56, ″.61.
Open at edges, ″.12 and ″.10.

No. 1336.

(¼″ steel plate.)



(13/16″ iron rivets; ⅞″ drilled holes; 2⅝″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 125
Net sectional area of plate	2. 084
Bearing surface of rivets	1. 041
Shearing area of rivets	6. 013

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 125	1, 000	0.	0.	Initial load.
6, 250	2, 000	.0001	....	
9, 375	3, 000	.0001	....	
12, 500	4, 000	.0002	....	
15, 625	5, 000	.0003	.0002	
18, 750	6, 000	.0003	....	
21, 875	7, 000	.0004	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
25,000	8,000	.0005	....	
28,125	9,000	.0006	....	
31,250	10,000	.0009	.0008	
34,375	11,000	.0017	....	
37,500	12,000	.0024	....	
40,625	13,000	.0030	....	
43,750	14,000	.0039	....	
46,875	15,000	.0049	.0045	
50,000	16,000	.0064	....	
53,125	17,000	.0076	....	
56,250	18,000	.0083	....	
59,375	19,000	.0086	....	
62,500	20,000	.0097	.0063	
65,625	21,000	.0106	....	
68,750	22,000	.0116	....	
71,875	23,000	.0123	....	
75,000	24,000	.0143	....	
78,125	25,000	.0159	.0138	
81,250	26,000	.0182	....	
84,375	27,000	.0198	....	
87,500	28,000	.0232	....	
90,625	29,000	.0250	....	
93,750	30,000	.0305	.0278	
96,875	31,000	.0462	....	
100,000	32,000	.0676	....	Scale starts.
103,125	33,000	.0976	....	Edges contract.
106,250	34,000	.1208	....	
109,375	35,000	.14	....	
112,500	36,000	.17	....	
115,625	37,000	.22	....	
118,750	38,000	.28	....	
121,875	39,000	.31	....	
125,000	40,000	.38	....	
128,125	41,000	.46	....	
129,100	41,310	.52	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge. Appearance silky, lamellar.

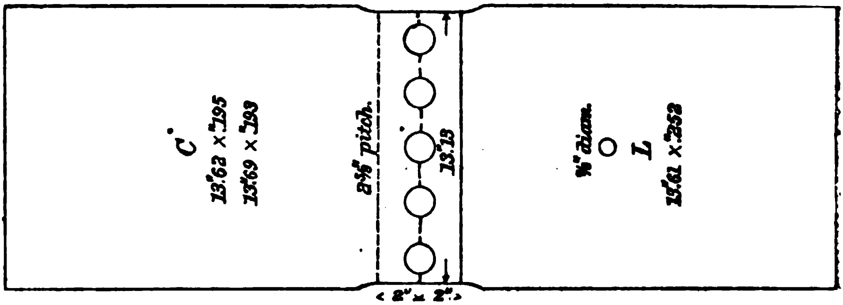
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	41,310
Tension on net section of plate	61,960
Compression on bearing surface of rivets	124,020
Shearing on rivets	21,470

Elongation of rivet holes, ″.75, ″.71, ″.65, ″.64, ″.65.
Open at edges, ″.07 and ″.15.

No. 1337.

($\frac{1}{4}$″ steel plate.)



($\frac{13}{16}$″ iron rivets; $\frac{7}{8}$″ drilled holes; 2⅝″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.309
Net sectional area of plate	2.206
Bearing surface of rivets	1.103
Shearing area of rivets	6.013

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,309	1,000	0.	0.	Initial load.
6,618	2,000	.0001	....	
9,927	3,000	.0002	....	
13,236	4,000	.0003	....	
16,545	5,000	.0004	.0002	
19,854	6,000	.0005	....	
23,163	7,000	.0007	....	
26,472	8,000	.0010	....	
29,781	9,000	.0013	....	
33,090	10,000	.0020	.0015	
36,399	11,000	.0026	....	
39,708	12,000	.0034	....	
43,017	13,000	.0040	....	
46,326	14,000	.0049	....	
49,635	15,000	.0061	.0045	
52,944	16,000	.0075	....	
56,253	17,000	.0083	....	
59,562	18,000	.0092	....	
62,871	19,000	.0099	....	
66,180	20,000	.0107	.0079	
69,489	21,000	.0121	....	
72,798	22,000	.0130	....	
76,107	23,000	.0140	....	
79,416	24,000	.0155	....	
82,725	25,000	.0167	.0127	
86,034	26,000	.0190	....	
89,343	27,000	.0205	....	
92,652	28,000	.0224	....	
95,961	29,000	.0260	....	
99,270	30,000	.0323	.0269	
102,579	31,000	.0482	....	
105,888	32,000	.0678	....	
109,197	33,000	.0915	....	Edges contract.
112,506	34,000	.1110	....	
115,815	35,000	.14	....	
119,124	36,000	.18	....	Scale starts.
122,433	37,000	.20	....	
125,742	38,000	.25	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
129, 051	39, 000	.29	....	
132, 360	40, 000	.37	....	
135, 664	41, 000	.41	....	
138, 200	41, 760	.49	....	
138, 968	42, 000	.52	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

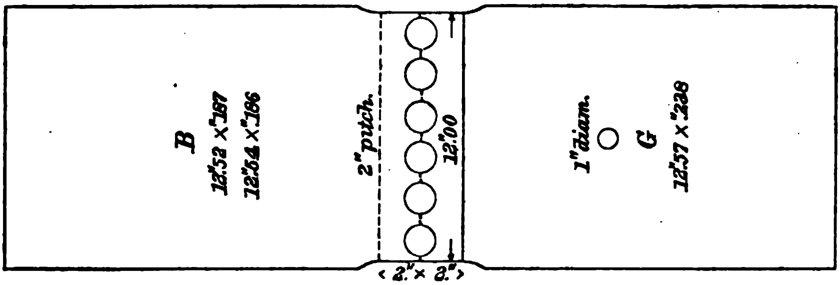
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	42, 000
Tension on net section of plate	62, 990
Compression on bearing surface of rivets	125, 990
Shearing on rivets	23, 110

Elongation of rivet holes, ''.71, ''.70, ''.65, ''.65, ''.58.
Open at edges, ''.12 and ''.27.

No. 1338.

($\frac{1}{4}$'' steel plate.)



($\frac{15}{16}$'' iron rivets; 1'' drilled holes; 2'' pitch.)

Areas.

	Square inches.
Gross sectional area of plate	2.856
Net sectional area of plate	1.428
Bearing surface of rivets	1.428
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2, 856	1, 000	0.	0.	Initial load
5, 712	2, 000	.0001	....	
8, 568	3, 000	.0002	....	
11, 424	4, 000	.0003	....	
14, 280	5, 000	.0005	.0003	
17, 136	6, 000	.0011	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
19,992	7,000	.0015	....	
22,848	8,000	.0021	....	
25,704	9,000	.0026	....	
28,560	10,000	.0032	.0018	
31,416	11,000	.0039	....	
34,272	12,000	.0047	....	
37,128	13,000	.0056	....	
39,984	14,000	.0063	....	
42,840	15,000	.0070	.0043	
45,696	16,000	.0080	....	
48,552	17,000	.0085	....	
51,408	18,000	.0093	....	
54,264	19,000	.0099	....	
57,120	20,000	.0104	.0066	
59,976	21,000	.0114	....	
62,832	22,000	.0119	....	
65,688	23,000	.0125	....	
68,544	24,000	.0135	....	
71,400	25,000	.0142	.0090	
74,256	26,000	.0155	....	
77,112	27,000	.0166	....	
79,968	28,000	.0176	....	
82,824	29,000	.0187	....	
85,680	30,000	.0209	.0144	
88,536	31,000	.0243	....	
91,392	32,000	.0276	....	
94,248	33,000	.0314	....	Edges contract and scales start.
97,104	34,000	.0380	....	
99,960	35,000	.0440	.0352	
102,816	36,000	.0605	....	
105,672	37,000	.0735	....	
108,528	38,000	.088	....	
111,384	39,000	.105	....	
114,240	40,000	.15	....	
116,000	40,620	.20	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge. Appearance silky.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40,620
Tension on net section of plate	81,230
Compression on bearing surface of rivets	81,230
Shearing on rivets	12,310

Elongation of rivet holes, ″.28, ″.27, ″.26, ″.28, ″.31, ″.33.
Open at edges, ″.07 and ″.17.

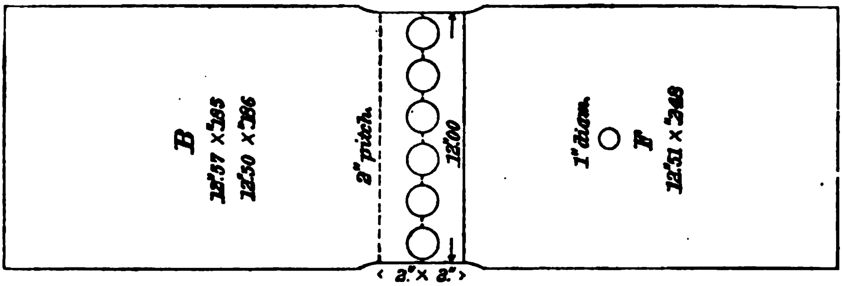
Fractured areas.

Square inch.
.40× .17=.0680
.39× .14=.1246
.88× .13=.1144
.87× .13=.1131
.88× .14=.1232
.89× .13=.1157
.38× .18=.0684

.7274; contraction, 49.1 per cent

No. 1339.

(¼″ steel plate.)



($\frac{15}{16}$″ iron rivets; 1″ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	2.976
Net sectional area of plate	1.488
Bearing surface of rivets	1.488
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
2,976	1,000	0.	0.	Initial load.
5,952	2,000	.0001	....	
8,928	3,000	.0002	....	
11,904	4,000	.0003	....	
14,880	5,000	.0004	.0003	
17,856	6,000	.0007	....	
20,832	7,000	.0020	....	
23,808	8,000	.0033	....	
26,784	9,000	.0047	....	
29,760	10,000	.0060	.0053	
32,736	11,000	.0063	....	
35,712	12,000	.0073	....	
38,688	13,000	.0083	....	
41,664	14,000	.0092	....	
44,640	15,000	.0100	.0080	
47,616	16,000	.0104	....	
50,592	17,000	.0114	.0093	
53,568	18,000	.0122	....	
56,544	19,000	.0130	....	
59,520	20,000	.0140	.0110	
62,496	21,000	.0160	....	
65,472	22,000	.0165	....	
68,448	23,000	.0180	....	
71,424	24,000	.0194	....	
74,400	25,000	.0216	.0168	
77,376	26,000	.0246	....	
80,352	27,000	.0271	....	
83,328	28,000	.0312	....	
86,304	29,000	.0360	....	
89,280	30,000	.0455	.0392	Edges contract.
92,256	31,000	.0587	....	
95,232	32,000	.0714	....	
98,208	33,000	.0860	....	
101,184	34,000	.1060	....	
104,160	35,000	.13	....	
107,136	36,000	.19	....	
108,000	36,290	....	....	Tensile strength.

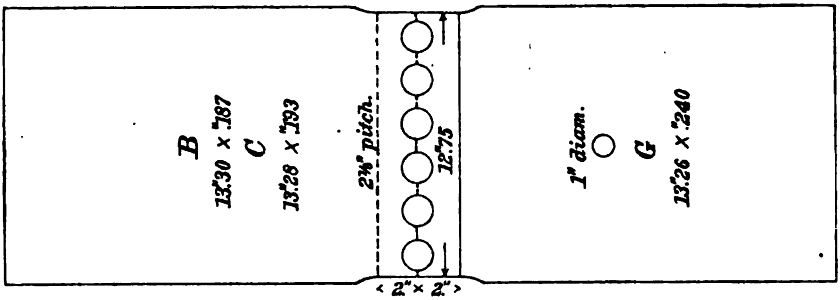
Simultaneous fracture along line of riveting. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	36,290
Tension on net section of plate	72,580
Compression on bearing surface of rivets	72,580
Shearing on rivets	11,460

Elongation of rivet holes, ″.31, ″.31, ″.33, ″.32, ″.32, ″.32.
Width of rivet holes, 1″.10, 1″.13, 1″.13, 1″.14, 1″.15, 1″.10.
Open at edges, ″.03 and ″.05.

No. 1340.

($\frac{1}{4}''$ steel plate.)



($\frac{15}{16}''$ iron rivets; $1''$ drilled holes; $2\frac{1}{8}''$ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.060
Net sectional area of plate	1.620
Bearing surface of rivets	1.440
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
118,300	38,660	....	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky.

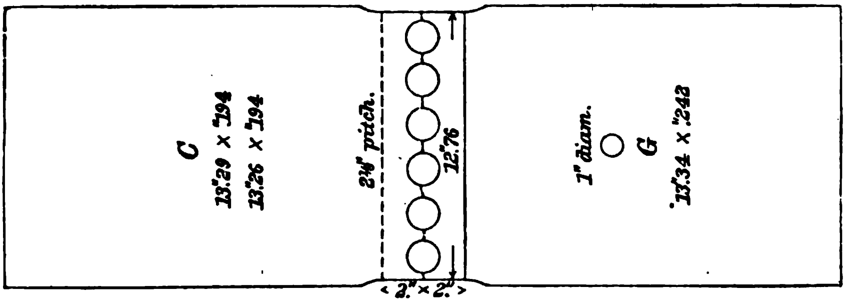
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	38,660
Tension on net section of plate	73,020
Compression on bearing surface of rivets	82,150
Shearing on rivets	12,550

Elongation of rivet holes, ″.34, ″.34, ″.35, ″.37, ″.36, ″.38.
Open at edges, ″.05 and ″.07.

No. 1341.

(¼″ steel plate.)



($\frac{15}{16}$″ iron rivets; 1″ drilled holes; 2⅛″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.088
Net sectional area of plate	1.636
Bearing surface of rivets	1.452
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
117,344	38,000	....	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky.

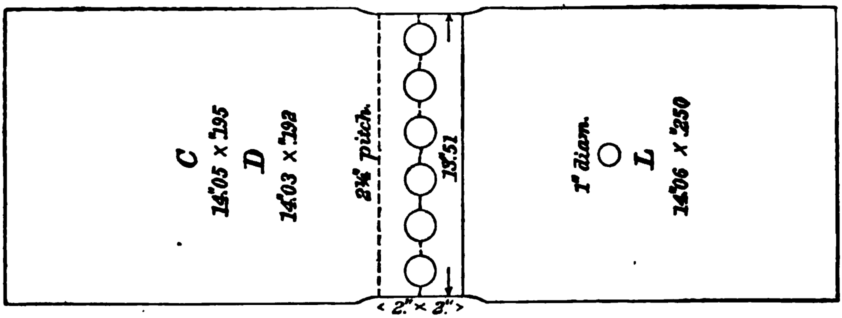
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	38,000
Tension on net section of plate	71,730
Compression on bearing surface of rivets	80,820
Shearing on rivets	12,450

Elongation of rivet holes, ″.38, ″.39, ″.38, ″.38, ″.37, ″.34.
Open at edges, ″.02 each.

No. 1342.

($\frac{1}{4}''$ steel plate.)



($\frac{15}{16}''$ iron rivets; 1″ drilled holes; $2\frac{1}{4}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.378
Net sectional area of plate	1.878
Bearing surface of rivets	1.500
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 378	1, 000	0.	0.	Initial load.
6, 756	2, 000	.0001	....	
10, 134	3, 000	.0007	....	
13, 512	4, 000	.0010	....	
16, 890	5, 000	.0011	.0009	
20, 268	6, 000	.0014	....	
23, 646	7, 000	.0019	....	
27, 024	8, 000	.0026	....	
30, 402	9, 000	.0032	....	
33, 780	10, 000	.0039	.0032	
37, 158	11, 000	.0047	....	
40, 536	12, 000	.0060	....	
43, 914	13, 000	.0074	....	
47, 292	14, 000	.0086	....	
50, 670	15, 000	.0094	.0076	
54, 048	16, 000	.0101	....	
57, 426	17, 000	.0107	....	
60, 804	18, 000	.0113	....	
64, 182	19, 000	.0120	....	
67, 560	20, 000	.0127	.0096	Rested under initial load fifteen hours.
70, 938	21, 000	.0130	....	
74, 316	22, 000	.0135	....	
77, 694	23, 000	.0153	....	
81, 072	24, 000	.0172	....	
84, 450	25, 000	.0195	.0149	
87, 828	26, 000	.0232	....	
91, 206	27, 000	.0265	....	
94, 584	28, 000	.0300	....	
97, 962	29, 000	.0360	....	
101, 340	30, 000	.0466	.0395	
104, 718	31, 000	.0610	....	Edges contract
108, 096	32, 000	.0730	....	
111, 474	33, 000	.0875	....	
114, 852	34, 000	.1070	....	
118, 230	35, 000	.12	....	
121, 608	36, 000	.16	....	
124, 986	37, 000	.21	....	
127, 700	37, 800	.28	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky, slight lamination.

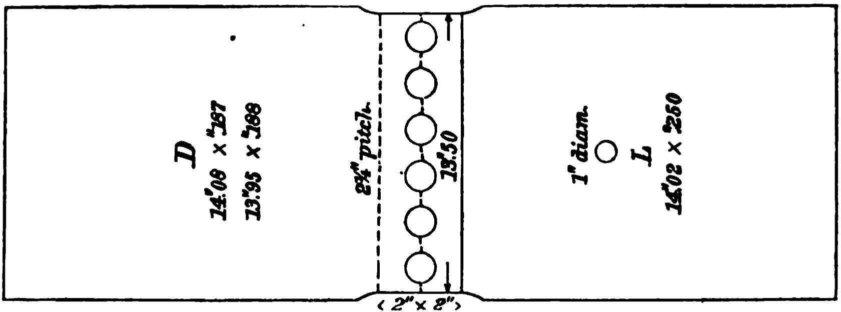
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37, 800
Tension on net section of plate	68, 000
Compression on bearing surface of rivets	85, 133
Shearing on rivets	13, 550

Elongation of rivet holes, ″.38, ″.38, ″.38, ″.39, ″.38, ″38.

Open at edges, ″.03 and ″.04.

No. 1343.

(¼″ steel plate.)



(1 5/16″ iron rivets; 1″ drilled holes; 2¼″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.375
Net sectional area of plate	1.875
Bearing surface of rivets	1.500
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,375	1,000	0.	0.	Initial load.
6,750	2,000	0.	....	
10,125	3,000	.0001	....	
13,500	4,000	.0002	....	
16,875	5,000	.0003	.0001	
20,250	6,000	.0004	....	
23,625	7,000	.0005	....	
27,000	8,000	.0008	....	
30,375	9,000	.0012	....	
33,750	10,000	.0018	.0016	
37,125	11,000	.0029	....	
40,500	12,000	.0038	....	
43,875	13,000	.0047	....	
47,250	14,000	.0053	....	
50,625	15,000	.0062	.0046	
54,000	16,000	.0076	....	
57,375	17,000	.0086	....	
60,750	18,000	.0094	....	
64,125	19,000	.0104	....	
67,500	20,000	.0113	.0083	
70,875	21,000	.0128	....	
74,250	22,000	.0136	....	
77,625	23,000	.0143	....	
81,000	24,000	.0151	....	
84,375	25,000	.0163	.0115	
87,750	26,000	.0185	....	
91,125	27,000	.0206	....	
94,500	28,000	.0252	....	
97,875	29,000	.0302	....	
101,250	30,000	.0376	.0302	
104,625	31,000	.0476	....	
108,000	32,000	.0572	....	
111,375	33,000	.0683	....	Edges contract.
114,750	34,000	.0807	....	
118,125	35,000	.0980	....	
121,500	36,000	.1170	....	
124,875	37,000	.14	....	
128,250	38,000	.18	....	
131,625	39,000	.30	....	Tensile strength.

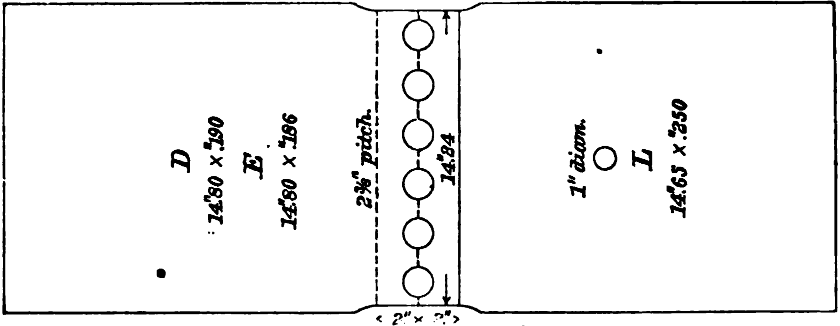
Fractured along line of riveting, beginning at the east edge. Appearance silky, slight lamination.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,000
Tension on net section of plate	70,200
Compression on bearing surface of rivets	87,750
Shearing on rivets	13,970

Elongation of rivet holes, ″.42, ″.42, ″.40, ″.38, ″.37, ″.39.
Open at edges, ″.04.

No. 1344.

(¼" steel plate.)



(15/16" iron rivets; 1" drilled holes; 2⅝" pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.560
Net sectional area of plate	2.060
Bearing surface of rivets	1.500
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,560	1,000	0.	0.	Initial load.
7,120	2,000	0.		
10,680	3,000	0.		
14,240	4,000	.0001		
17,800	5,000	.0002	.0001	
21,360	6,000	.0004		
24,920	7,000	.0007		
28,480	8,000	.0013		
32,040	9,000	.0018		
35,600	10,000	.0025	.0020	
39,160	11,000	.0033		
42,720	12,000	.0039		
46,280	13,000	.0045		
49,840	14,000	.0051		
53,400	15,000	.0058	.0038	
56,960	16,000	.0069		
60,520	17,000	.0078		
64,080	18,000	.0087		
67,640	19,000	.0095		
71,200	20,000	.0104	.0071	
74,760	21,000	.0119		
78,320	22,000	.0127		
81,880	23,000	.0135		
85,440	24,000	.0146		
89,000	25,000	.0160	.0112	
92,560	26,000	.0187		
96,120	27,000	.0240		
99,680	28,000	.0300		
103,240	29,000	.0365		Edges contract.
106,800	30,000	.0457	.0386	
110,360	31,000	.0571		
113,920	32,000	.0690		
117,480	33,000	.0830		
121,040	34,000	.100		
124,600	35,000	.11		
128,160	36,000	.15		
131,720	37,000	.18		
135,280	38,000	.21		
138,840	39,000	.29		
139,300	39,130	.34		Tensile strength.

Fractured along center line of rivet holes, beginning at the east edge. Appearance silky.

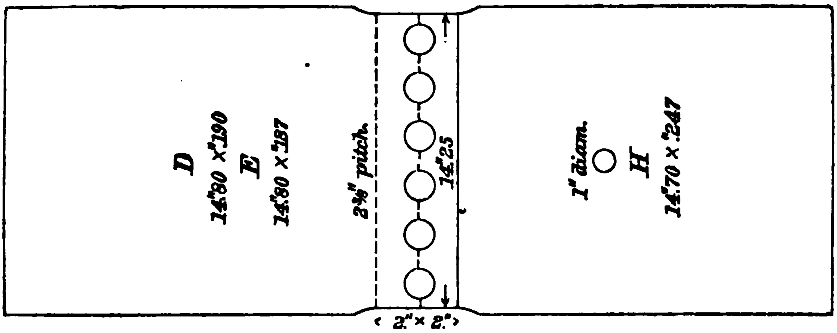
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,130
Tension on net section of plate	67,640
Compression on bearing surface of rivets	92,870
Shearing on rivets	14,780

Elongation of rivet holes, ".48, ".44 ".42, ".42, ".44, ".50.

Fractured ends open at edges of plate, ".05 and ".10.

No. 1345.

(¼″ steel plate.)



(15/16″ iron rivets; 1″ drilled holes; 2⅜″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.520
Net sectional area of plate	2.038
Bearing surface of rivets	1.482
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,520	1,000	0.	0.	Initial load.
7,040	2,000	0.	....	
10,560	3,000	.0002	....	
14,080	4,000	.0003	....	
17,600	5,000	.0004	.0001	
21,120	6,000	.0006	....	
24,640	7,000	.0008	....	
28,160	8,000	.0011	....	
31,680	9,000	.0019	....	
35,200	10,000	.0033	.0022	
38,720	11,000	.0044	....	
42,240	12,000	.0057	....	
45,760	13,000	.0068	....	
49,280	14,000	.0080	....	
52,800	15,000	.0088	.0063	
56,320	16,000	.0095	....	
59,840	17,000	.0103	....	
63,360	18,000	.0108	....	
66,880	19,000	.0114	....	
70,400	20,000	.0119	.0082	
73,920	21,000	.0127	....	
77,440	22,000	.0137	....	
80,960	23,000	.0147	....	
84,480	24,000	.0158	....	
88,000	25,000	.0171	.0119	
91,520	26,000	.0190	....	
95,040	27,000	.0205	....	
98,560	28,000	.0225	....	
102,080	29,000	.0267	....	
105,600	30,000	.0300	.0229	
109,120	31,000	.0372	....	
112,640	32,000	.0479	....	
116,160	33,000	.0604	....	Edges contract and scale starts.
119,680	34,000	.0717	....	
123,200	35,000	.0868	....	
126,720	36,000	.1025	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
130, 240	37, 000	. 13	....	
133, 760	38, 000	. 18	....	
137, 280	39, 000	. 20	....	
140, 800	40, 000	. 25	....	
142, 380	40, 450	. 33	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky, lamellar.

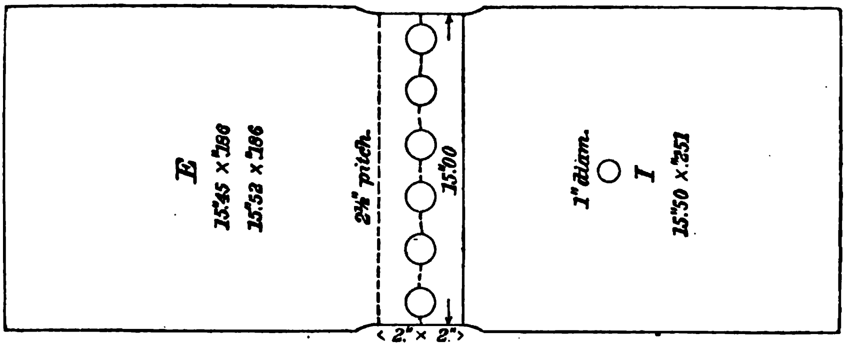
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40. 450
Tension on net section of plate	69. 860
Compression on bearing surface of rivets	96. 070
Shearing on rivets	15. 110

Elongation of rivet holes, ″.42, ″.41, ″.42, ″.42, ″.48, ″.48.
Edges open ″.07 each.

No. 1346.

(¼″ steel plate.)



(1 5/16″ iron rivets; 1″ drilled holes; 2½ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 765
Net sectional area of plate	2. 259
Bearing surface of rivets	1. 506
Shearing area of rivets	9. 425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 765	1, 000	0.	0.	Initial load.
7, 530	2, 000	. 0001	....	
11, 295	3, 000	. 0003	....	
15, 060	4, 000	. 0008	....	
18, 825	5, 000	. 0015	. 0007	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
22,590	6,000	.0025	....	
26,355	7,000	.0030	....	
30,120	8,000	.0037	....	
33,885	9,000	.0045	....	
37,650	10,000	.0050	.0030	
41,415	11,000	.0060	....	
45,180	12,000	.0066	....	
48,945	13,000	.0070	....	
52,710	14,000	.0076	....	
56,475	15,000	.0085	.0050	
60,240	16,000	.0092	....	
64,005	17,000	.0099	....	
67,770	18,000	.0107	....	
71,535	19,000	.0112	....	
75,300	20,000	.0120	.0070	
79,065	21,000	.0134	....	
82,830	22,000	.0140	....	
86,595	23,000	.0147	....	
90,360	24,000	.0156	....	
94,125	25,000	.0165	.0097	
97,890	26,000	.0181	....	
101,655	27,000	.0190	....	
105,420	28,000	.0205	....	
109,185	29,000	.0217	....	
112,950	30,000	.0230	.0145	
116,715	31,000	.0255	....	
120,480	32,000	.0267	....	
124,245	33,000	.0286	....	
128,010	34,000	.0310	....	Edges contract and scale starts.
131,775	25,000	.0383	....	
135,540	36,000	.0499	....	
139,305	37,000	.0627	....	
143,070	38,000	.0750	....	
146,835	39,000	.0970	....	
150,600	40,000	.1230	....	
154,365	41,000	.15	....	
158,130	42,000	.19	....	
161,895	43,000	.23	....	
164,100	43,590	.28	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

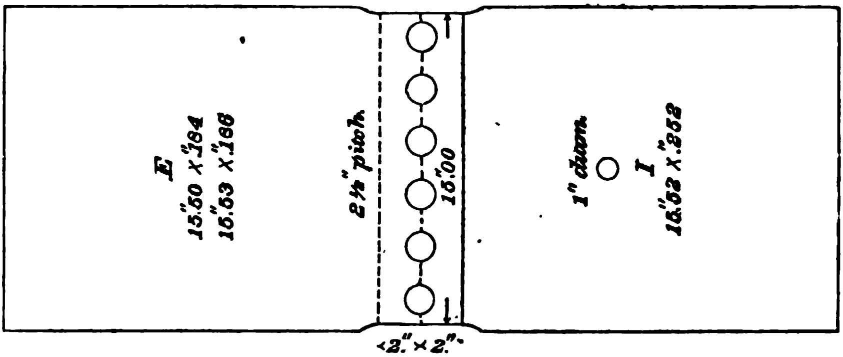
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate..	43,590
Tension on net section of plate..	72,640
Compression on bearing surface of rivets..	108,960
Shearing on rivets..	17,410

Elongation of rivet holes, ″.60, ″.55, ″.48, ″.48, ″.46, ″.52.
Open at edges, ″.35 and ″.15.

No. 1347.

(¼" steel plates.)



(1 5/16" iron rivets; 1" drilled holes; 2½ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.780
Net sectional area of plate	2.268
Bearing surface of rivets	1.512
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 780	1, 000	0.	0.	Initial load.
7, 560	2, 000	0.	....	
11, 340	3, 000	.0001	....	
15, 120	4, 000	.0001	....	
18, 900	5, 000	.0002	—.0001	
22, 680	6, 000	.0004	....	
26, 460	7, 000	.0009	....	
30, 240	8, 000	.0017	....	
34, 020	9, 000	.0032	....	
37, 800	10, 000	.0043	.0033	
41, 580	11, 000	.0052	....	
45, 360	12, 000	.0062	....	
49, 140	13, 000	.0070	....	
52, 920	14, 000	.0075	....	
56, 700	15, 000	.0082	.0060	
60, 480	16, 000	.0092	....	
64, 260	17, 000	.0100	....	
68, 040	18, 000	.0106	....	
71, 820	19, 000	.0115	....	
75, 600	20, 000	.0125	.0087	
79, 380	21, 000	.0139	....	
83, 160	22, 000	.0150	....	
86, 940	23, 000	.0160	....	
90, 720	24, 000	.0172	....	
94, 500	25, 000	.0184	.0132	
98, 280	26, 000	.0204	....	
102, 060	27, 000	.0220	....	
105, 840	28, 009	.0241	....	
109, 620	29, 000	.0285	....	
113, 400	30, 000	.0348	.0276	
117, 180	31, 000	.0466	....	
120, 960	32, 000	.0558	....	Edges contract.
124, 740	33, 000	.0670	....	Scale starts.
128, 520	34, 000	.0811	....	
132, 300	35, 000	.0978	....	
136, 080	36, 000	.1165	....	
139, 860	37, 000	.15	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
143, 640	38, 000	.17	....	
147, 420	39, 000	.19	....	
151, 200	40, 000	.23	....	
154, 980	41, 000	.30	....	
156, 560	41, 420	.36	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

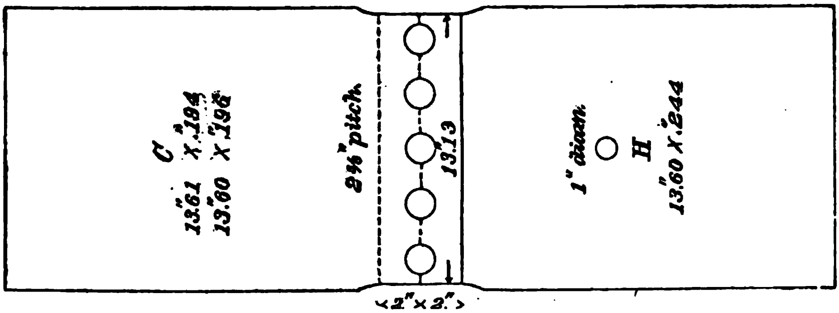
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	41,420
Tension on net section of plate	69, 030
Compression on bearing surface of rivets	103, 540
Shearing on rivets	16, 610

Elongation of rivet holes, ″.54, ″.49, ″.48, ″.48, ″.49, ″.54.
Open at edges, ″.12 and ″.15.

No 1348.

(¼″ steel plates.)



(1⁵⁄₁₆″ iron rivets; 1″ drilled holes; 2⅝″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 204
Net sectional area of plate	1. 984
Bearing service of rivets	1. 220
Shearing area of rivets	7. 855

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 204	1, 000	0.	0.	Initial load.
6, 408	2, 000	0.	....	
9, 612	3, 000	0.	....	
12, 816	4, 000	0.	....	
16, 020	5, 000	0. +	0.	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
19,224	6,000	.0001		
22,428	7,000	.0001		
25,632	8,000	.0002		
28,836	9,000	.0003		
32,040	10,000	.0007	.0004	
35,244	11,000	.0012		
38,448	12,000	.0023		
41,652	13,000	.0029		
44,856	14,000	.0038		
48,060	15,000	.0045	.0033	
51,264	16,000	.0054		
54,468	17,000	.0060		
57,672	18,000	.0063		
60,876	19,000	.0070		
64,080	20,000	.0078	.0052	
67,284	21,000	.0090		
70,488	22,000	.0096		
73,692	23,000	.0104		
76,896	24,000	.0114		
80,100	25,000	.0125	.0085	
83,304	26,000	.0144		
86,508	27,000	.0155		
89,712	28,000	.0167		
92,916	29,000	.0205		
96,120	30,000	.0252	.0195	
99,324	31,000	.0355		
102,528	32,000	.0495		Edges contract and scale starts.
105,732	33,000	.0650		
108,936	34,000	.0890		
112,140	35,000	.1120		
115,344	36,000	.16		
118,548	37,000	.21		
121,752	38,000	.28		
123,980	38,700	.38		Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky, lamellar.

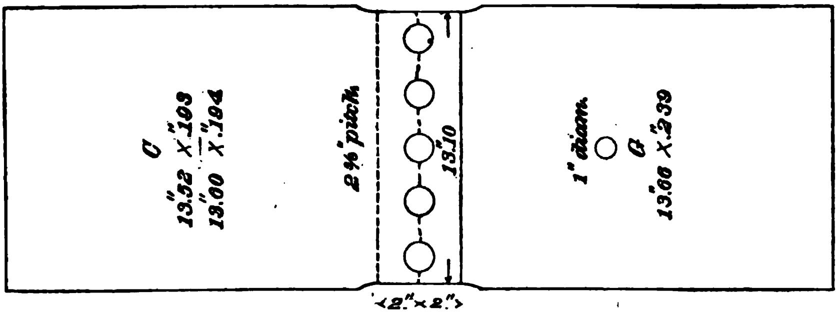
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	38,700
Tension on net section of plate	62,490
Compression on bearing surface of rivets	101,620
Shearing on rivets	15,790

Elongation of rivet holes, ″.55, ″.53, ″.54, ″.55, ″.58.
Open at edges, ″.15 and ″.20.

No. 1349.

(¼″ steel plate.)



(15/16″ iron rivets; 1″ drilled holes; 2⅝ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.131
Net sectional area of plate	1.936
Bearing surface of rivets	1.195
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
134,300	42,890	.42	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky.

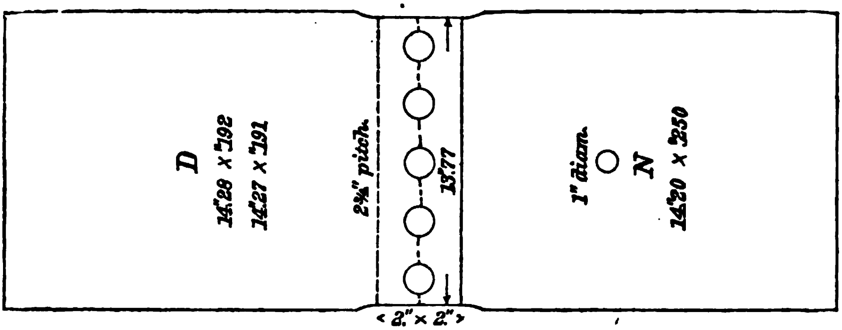
Maximum stress on joint.

	Pounds per square inch
Tension on gross section of plate	42,890
Tension on net section of plate	69,370
Compression on bearing surface of rivets	112,380
Shearing on rivets	17,100

Elongation of rivet holes, ″.61, ″.53, ″.53, ″.54, ″.59.
Open at edges, ″.12 and ″.17.

No. 1350.

(¼" steel plate.)



($\frac{15}{16}$" iron rivets; 1" drilled holes; 2¾-pitch.)

Areas.

	Square inch.
Gross sectional area of plate	3.442
Net sectional area of plate	2.192
Bearing surface of rivets	1.250
Shearing area of rivets	7.654

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,442	1,000	0.	0.	Initial load.
6,884	2,000	0.	....	
10,326	3,000	.0002	....	
13,768	4,000	.0003	....	
17,210	5,000	.0004	.0001	
20,652	6,000	.0007	....	
24,094	7,000	.0009	....	
27,536	8,000	.0015	....	
30,978	9,000	.0022	....	
34,420	10,000	.0035	.0031	
37,862	11,000	.0058	....	
41,304	12,000	.0070	....	
44,746	13,000	.0080	....	
48,188	14,000	.0088	....	
51,630	15,000	.0096	.0075	
55,072	16,000	.0108	....	
58,514	17,000	.0113	....	
61,956	18,000	.0120	....	
65,398	19,000	.0128	....	
68,840	20,000	.0143	.0106	
72,282	21,000	.0160	....	
75,724	22,000	.0170	....	
79,166	23,000	.0183	....	
82,608	24,000	.0196	....	
86,050	25,000	.0207	.0155	
89,492	26,000	.0229	....	
92,934	27,000	.0235	....	
96,376	28,000	.0249	....	
99,818	29,000	.0275	....	
103,260	30,000	.0305	.0235	
106,702	31,000	.0380	....	
110,144	32,000	.0438	....	
113,586	33,000	.0538	....	
117,028	34,000	.0731	....	
120,470	35,000	.0940	.0830	Edges contract.
123,912	36,000	.1180	....	
127,354	37,000	.15	....	
130,796	38,000	.18	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
134,238	39,000	.20	....	
137,680	40,000	.24	....	Scale starts.
141,122	41,000	.30	....	
144,564	42,000	.37	....	
147,880	42,960	.48 .50	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky.

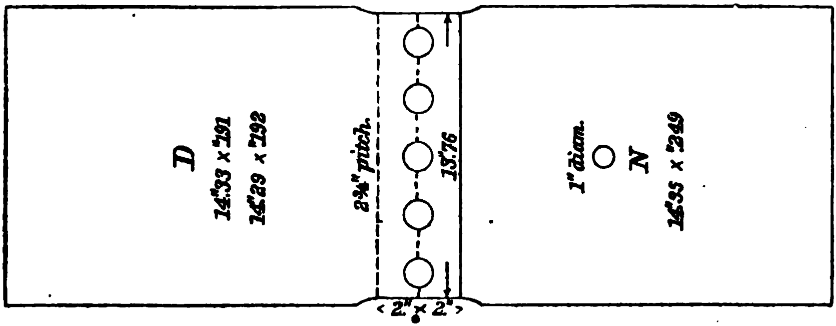
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	42,960
Tension on net section of plate	67,460
Compression on bearing surface of rivets	118,300
Shearing of rivets	18,830

Elongation of rivet holes, ″.59, ″.57, ″.58, ″.56, ″.58.

No. 1351.

(¼″ steel plate.)



($\frac{15}{16}$″ iron rivets; 1″ drilled holes; 2¾″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.426
Net sectional area of plate	2.181
Bearing surface of rivets	1.245
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,426	1,000	0.	0.	Initial load.
6,852	2,000	.0001	....	
10,278	3,000	.0003	....	
13,704	4,000	.0005	....	
17,130	5,000	.0007	.0003	
20,556	6,000	.0015	....	
23,982	7,000	.0024	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
27,408	8,000	.0034		
30,834	9,000	.0042		
34,260	10,000	.0048	.0032	
37,686	11,000	.0056		
41,112	12,000	.0063		
44,538	13,000	.0078		
47,964	14,000	.0093		
51,390	15,000	.0107	.0078	
54,816	16,000	.0121		
58,242	17,000	.0128		
61,668	18,000	.0135		
65,094	19,000	.0142		
68,520	20,000	.0151	.0106	
71,946	21,000	.0164		
75,372	22,000	.0175		
78,798	23,000	.0186		
82,224	24,000	.0198		
85,650	25,000	.0210	.0148	
89,076	26,000	.0230		
92,502	27,000	.0243		
95,928	28,000	.0263		
99,354	29,000	.0290		
102,780	30,000	.0340	.0258	
106,206	31,000	.0439		
109,632	32,000	.0560		
113,058	33,000	.0715		
116,484	34,000	.0960		Edges contract.
119,910	35,000	.1177		
123,336	36,000	.13		
126,762	37,000	.17		
130,188	38,000	.20		
133,614	39,000	.24		
137,040	40,000	.28		Scale starts.
140,466	41,000	.35		
143,150	41,780	.47		Tensile strength.

Fractured along line of riveting.

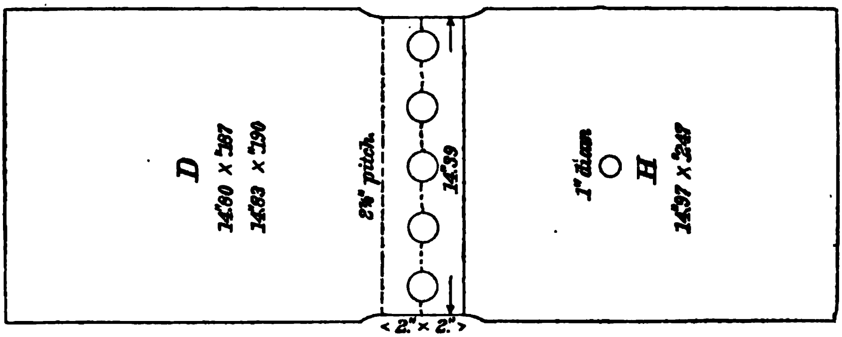
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	41,780
Tension on net section of plate	65,640
Compression on bearing surface of rivets	114,980
Shearing on rivets	18,290

Elongation of rivet holes, ″.56, ″.54, ″.53, ″.57, ″.49.

No. 1352.

(¼" steel plate.)



($\frac{15}{16}$" iron rivets; 1" drilled holes; 2⅞" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.554
Net sectional area of plate	2.319
Bearing surface of rivets	1.235
Shearing area of rivets	7.854

A load of 18,000 pounds per square inch applied and released before micrometer elongations were taken.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,554	1,000	0.	0.	Initial load.
7,108	2,000	0.	....	
10,662	3,000	.0001	....	
14,216	4,000	.0002	....	
17,770	5,000	.0002	.0001	
21,324	6,000	.0003	....	
24,878	7,000	.0004	....	
28,432	8,000	.0005	....	
31,986	9,000	.0006	....	
35,540	10,000	.0006	.0001	
39,094	11,000	.0008	....	
42,648	12,000	.0010	....	
46,202	13,000	.0012	....	
49,756	14,000	.0015	....	
53,310	15,000	.0017	.0002	
56,864	16,000	.0020	....	
60,418	17,000	.0023	....	
63,972	18,000	.0027	....	
67,526	19,000	.0035	....	
71,080	20,000	.0043	.0015	
74,634	21,000	.0054	....	
78,188	22,000	.0062	....	
81,742	23,000	.0072	....	
85,296	24,000	.0082	....	
88,850	25,000	.0094	.0062	
92,404	26,000	.0111	....	
95,958	27,000	.0120	....	
99,512	28,000	.0131	....	
103,066	29,000	.0145	....	
106,620	30,000	.0160	.0100	
110,174	31,000	.0188	....	
113,728	32,000	.0216	....	Scale starts.
117,282	33,000	.0284	....	Edges contract.
120,836	34,000	.0422	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
124,390	35,000	.0655	.0566	
127,944	36,000	.0900	....	
131,498	37,000	.1200	....	
135,052	38,000	.15	....	
138,606	39,000	.19	....	
142,160	40,000	.22	....	
145,714	41,000	.28	....	
149,268	42,000	.32	....	
152,822	43,000	.41	....	
154,650	43,510	.48	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky, laminated.

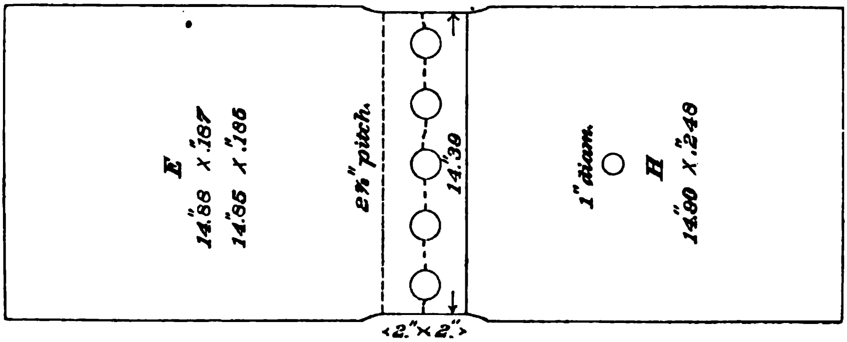
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43,510
Tension on net section of plate	66,690
Compression on bearing surface of rivets	123,220
Shearing on rivets	19,690

Elongation of rivet holes, ″.70, ″.67, ″.66, ″.71, ″.79.
Open at edges, ″.35 and ″.07.

No. 1353.

(¼" steel plate.)



($\frac{15}{16}$" iron rivets; 1" drilled holes; 2⅞" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.569
Net sectional area of plate	2.329
Bearing surface of rivets	1.240
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 569	1, 000	0.	0.	Initial load.
7, 138	2, 000	—. 0001	....	
10, 707	3, 000	0.	....	
14, 276	4, 000	. 0001	....	
17, 845	5, 000	. 0003	—. 0001	
21, 414	6, 000	. 0006	....	
24, 983	7, 000	. 0015	....	
28, 552	8, 000	. 0020	....	
32, 121	9, 000	. 0027	....	
35, 690	10, 000	. 0035	. 0022	
39, 259	11, 000	. 0045	....	
42, 828	12, 000	. 0049	....	
46, 397	13, 000	. 0053	....	
49, 966	14, 000	. 0059	....	
53, 535	15, 000	. 0064	. 0040	
57, 104	16, 000	. 0072	....	
60, 673	17, 000	. 0078	....	
64, 242	18, 000	. 0085	....	
67, 811	19, 000	. 0092	....	
71, 380	20, 000	. 0100	. 0062	
74, 949	21, 000	. 0111	....	
78, 518	22, 000	. 0120	....	
82, 087	23, 000	. 0130	....	
85, 656	24, 000	. 0138	....	
89, 225	25, 000	. 0150	. 0098	
92, 794	26, 000	. 0166	....	
96, 363	27, 000	. 0176	....	
99, 932	28, 000	. 0190	....	
103, 501	29, 000	. 0205	....	
107, 070	30, 000	. 0225	. 0157	
110, 639	31, 000	. 0252	....	
114, 208	32, 000	. 0279	....	
117, 777	33, 000	. 0328	....	Scale starts.
121, 346	34, 000	. 0452	....	
124, 915	35, 000	. 0718	. 0622	
128, 484	36, 000	. 101	....	
132, 053	37, 000	. 12	....	
135, 622	38, 000	. 15	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
139, 191	39, 000	. 19	....	
142, 760	40, 000	. 21	....	
146, 329	41, 000	. 28	....	
149, 898	42, 000	. 32	....	
153, 467	43, 000	. 42	....	
156, 440	43, 830	. 57	....	Tensile strength.

Fractured along line of riveting, beginning at the west edge. Appearance silky, laminated.

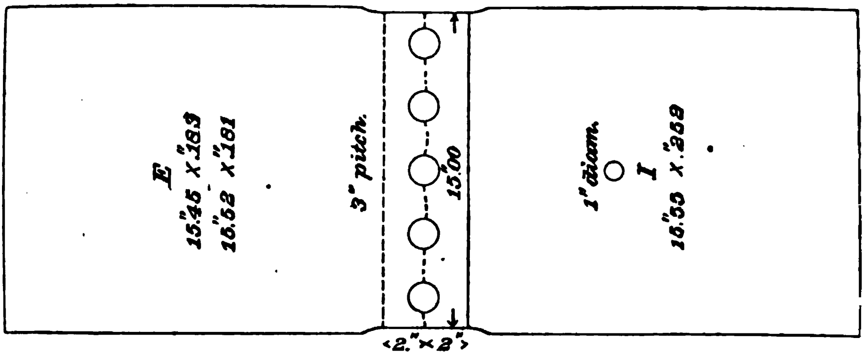
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	43, 830
Tension on net section of plate	67, 170
Compression on bearing surface of rivets	126, 160
Shearing on rivets	19, 920

Elongation of rivet holes, ″.72, ″.68, ″.61, ″.64, ″.69.
Open at edges, ″.25 and ″.20.

No. 1354.

(¼″ steel plate.)



(1⅝″ iron rivets; 1″ drilled holes; 3″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 780
Net sectional area of plate	2. 520
Bearing surface of rivets	1. 260
Shearing area of rivets	7. 854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 780	1, 000	0.	0.	Initial load.
7, 560	2, 000	0.	....	
11, 340	3, 000	0.	....	
15, 120	4, 000	. 0001	....	
18, 900	5, 000	. 0001	0.	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
22,680	6,000	.0003	....	
26,460	7,000	.0011	....	
30,240	8,000	.0018	....	
34,020	9,000	.0028	....	
37,800	10,000	.0036	.0033	
41,580	11,000	.0042	....	
45,360	12,000	.0050	....	
49,140	13,000	.0058	....	
52,920	14,000	.0068	....	
56,700	15,000	.0081	.0069	
60,480	16,000	.0094	....	
64,260	17,000	.0105	....	
68,040	18,000	.0116	....	
71,820	19,000	.0126	....	
75,600	20,000	.0135	.0111	
79,380	21,000	.0151	....	
83,160	22,000	.0163	....	
86,940	23,000	.0177	....	
90,720	24,000	.0195	....	
94,500	25,000	.0211	.0175	
98,280	26,000	.0242	....	
102,060	27,000	.0262	....	
105,840	28,000	.0294	....	
109,620	29,000	.0340	....	
113,400	30,000	.0444	.0384	Edges contract and scale starts.
117,180	31,000	.0711	....	
120,960	32,000	.0900	....	
124,740	33,000	.1110	....	
128,520	34,000	.14	....	
132,300	35,000	.165	....	
136,080	36,000	.205	....	
139,860	37,000	.21	....	
143,640	38,000	.25	....	
147,420	39,000	.31	....	
151,200	40,000	.36	....	Tensile strength.
168,500	44,580	....	....	

Fractured along line of riveting, beginning at the east edge. Appearance silky.

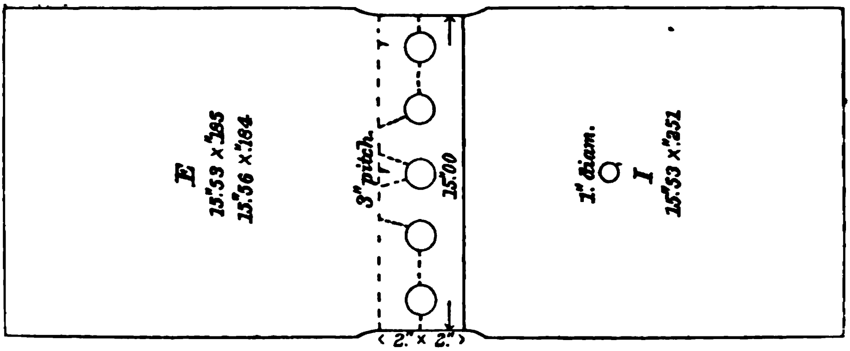
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	44,580
Tension on net section of plate	66,870
Compression on bearing surface of rivets	133,730
Shearing on rivets	21,450

Elongation of rivet holes, ″.95, ″.88, ″.82, ″.84, ″.96.
Open at edges, ″.10 and ″.20.

No. 1355.

(¼″ steel plate.)



(1⅝″ iron rivets; 1″ drilled holes; 3″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3.765
Net sectional area of plate	2.510
Bearing surface of rivets	1.255
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,765	1,000	0.	0.	Initial load.
7,530	2,000	.0001	....	
11,295	3,000	.0002	....	
15,060	4,000	.0004	....	
18,825	5,000	.0007	.0001	
22,590	6,000	.0011	....	
26,355	7,000	.0016	....	
30,120	8,000	.0023	....	
33,885	9,000	.0032	....	
37,650	10,000	.0048	.0034	
41,415	11,000	.0063	....	
45,180	12,000	.0076	....	
48,945	13,000	.0084	....	
52,710	14,000	.0091	....	
56,475	15,000	.0097	.0072	
60,240	16,000	.0107	....	
64,005	17,000	.0115	....	
67,770	18,000	.0124	....	
71,535	19,000	.0135	....	
75,300	20,000	.0147	.0106	
79,065	21,000	.0153	....	
82,830	22,000	.0176	....	
86,595	23,000	.0187	....	
90,360	24,000	.0202	....	
94,125	25,000	.0204	.0138	
97,890	26,000	.0236	....	
101,655	27,000	.0252	....	
105,420	28,000	.0275	....	
109,185	29,000	.0302	....	
112,950	30,000	.0342	.0269	
116,715	31,000	.0450	....	Edges contract, and scale starts.
120,480	32,000	.0690	....	
124,245	33,000	.100	....	
128,010	34,000	.18	....	
131,775	35,000	.15	....	
135,540	36,000	.19	....	
139,305	37,000	.21	....	
143,070	38,000	.26	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
146, 835	39, 000	.30	....	
150, 600	40, 000	.34	....	
154, 365	41, 000	.42	....	
158, 130	42, 000	.48	....	
161, 895	43, 000	.59	....	
165, 660	44, 000	.71	....	
167, 200	44, 410	.81	....	Tensile strength.

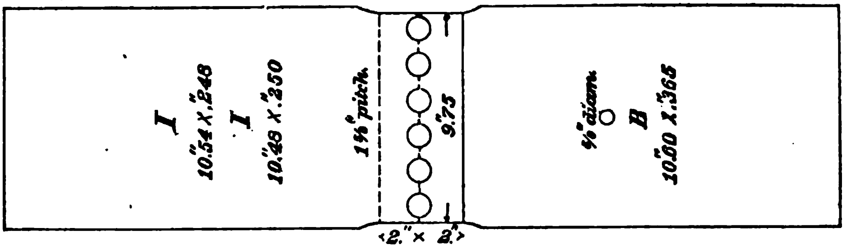
Fractured two outside sections of plate at each edge along line of riveting; the two middle sections sheared in front of rivets. Appearance silky.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	44, 410
Tension on net section of plate	66, 610
Compression on bearing surface of rivets	133, 230
Shearing on rivets	21, 290

No. 1356.

(⅜″ steel plate.)



(9/16″ iron rivets; ⅝ drilled holes; 1⅝″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	3. 559
Net sectional area of plate	2. 190
Bearing surface of rivets	1. 369
Shearing area of rivets	3. 682

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 559	1, 000	0.	0.	Initial load.
7, 118	2, 000	0.	....	
10, 679	3, 000	.0002	....	
14, 236	4, 000	.0003	....	
17, 795	5, 000	.0004	0.	
21, 354	6, 000	.0007	....	
24, 913	7, 000	.0008	....	
28, 472	8, 000	.0010	....	
32, 031	9, 000	.0012	....	
35, 590	10, 000	.0017	.0006	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
39,149	11,000	.0036	....	
42,708	12,000	.0044	....	
46,267	13,000	.0050	....	
49,826	14,000	.0054	....	
53,385	15,000	.0059	.0041	
56,944	16,000	.0065	....	
60,503	17,000	.0071	....	
64,062	18,000	.0078	....	
67,621	19,000	.0087	....	
71,180	20,000	.0094	.0066	
74,739	21,000	.0103	....	
78,298	22,000	.0112	....	
81,857	23,000	.0121	....	
85,416	24,000	.0132	....	
88,975	25,000	.0147	.0101	
92,534	26,000	.0168	....	
96,093	27,000	.0191	....	
99,652	28,000	.0233	....	
103,211	29,000	.0336	....	
106,770	30,000	.0432	.0350	
110,329	31,000	.0524	....	
113,888	32,000	.0634	....	
117,447	33,000	.0750	....	
121,006	34,000	.0975	....	Edges contract, and scale starts.
124,565	35,000	.1170	....	
128,124	36,000	.14	....	
131,683	37,000	.17	....	
135,242	38,000	.20	....	
138,801	39,000	.23	....	
142,360	40,000	.28	....	
143,980	40,460	.32	....	Tensile strength.

Simultaneous fracture along line of riveting. Appearance silky, lamellar.

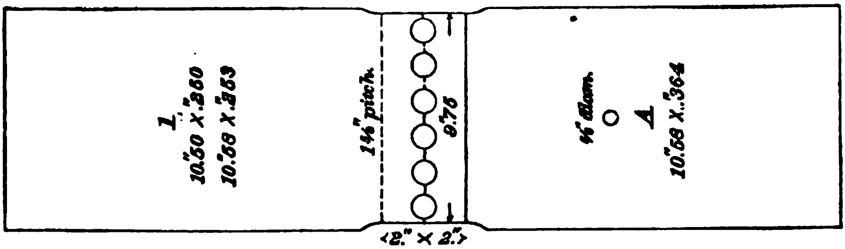
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40,460
Tension on net section of plate	65,740
Compression on bearing surface of rivets	105,170
Shearing on rivets	39,100

Elongation of rivet holes, ″.44, ″.41, ″.40, ″38, ″.39, ″38.
Open at edges, ″.12 and ″.10.

No. 1357.

($\frac{3}{8}''$ steel plate.)



($\frac{9}{16}''$ iron rivets; $\frac{5}{8}''$ drilled holes; $1\frac{5}{8}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3. 549
Net sectional area of plate	2. 184
Bearing surface of rivets	1. 365
Shearing area of rivets	3. 682

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 549	1, 000	0.	0.	Initial load.
7, 098	2, 000	0.	....	
10, 647	3, 000	.0001	....	
14, 196	4, 000	.0003	....	
17, 745	5, 000	.0003	0.	
21, 294	6, 000	.0004	....	
24, 843	7, 000	.0006	....	
28, 392	8, 000	.0010	....	
31, 941	9, 000	.0015	....	
35, 490	10, 000	.0029	.0019	
39, 039	11, 000	.0036	....	
42, 588	12, 000	.0044	....	
46. 137	13, 000	.0050	....	
49, 686	14, 000	.0056	....	
53, 235	15, 000	.0061	.0042	
56, 784	16, 000	.0066	....	
60, 333	17, 000	.0071	....	
63, 882	18, 000	.0076	....	
67, 431	19, 000	.0082	....	
70, 980	20, 000	.0091	.0060	
74, 529	21, 000	.0101	....	
78, 078	22, 000	.0111	....	
81, 627	23, 000	.0122	....	
85, 176	24, 000	.0134	....	
88, 725	25, 000	.0147	.0099	
92, 274	26, 000	.0173	....	
95, 823	27, 000	.0213	....	
99, 372	28, 000	.0313	....	
102, 921	29, 000	.0411	....	
106, 470	30, 000	.0509	.0428	Edges contract and scale starts.
110, 019	31, 000	.0630	....	
113, 568	32, 000	.0810	....	
117, 117	33, 000	.110	....	
120, 666	34, 000	.13	....	
124, 215	35, 000	.15	....	
127, 764	36, 000	.17	....	
131, 313	37, 000	.20	....	
134, 862	38, 000	.23	....	
138, 411	39, 000	.29	....	
139, 900	39, 420	.34	....	Tensile strength.

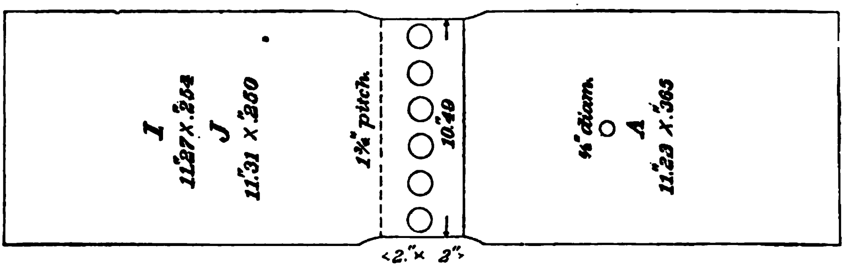
Simultaneous fracture along line of riveting. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39, 420
Tension on net section of plate	64, 060
Compression on bearing surface of rivets	102, 490
Shearing on rivets	38, 000

Elongation of rivet holes, ''.43, ''.44, ''.41, ''.40, ''.41.
Open at edges, ''.15 and ''.10.

No. 1358.

(⅜″ steel plate.)



($\frac{9}{16}$ iron rivets; ⅝″ drilled holes; 1¾″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3. 829
Net sectional area of plate	2. 460
Bearing surface of rivets	1. 369
Shearing area of rivets	3. 682

A load of 10,000 pounds per square inch applied and released before micrometer readings were taken.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3, 829	1, 000	0.	0.	Initial load.
7, 658	2, 000	. 0001	....	
11, 487	3, 000	. 0001	....	
15, 316	4, 000	. 0002	....	
19, 145	5, 000	. 0003	. 0002	
22, 974	6, 000	. 0003	....	
26, 803	7, 000	. 0006	....	
30, 632	8, 000	. 0007	....	
34, 461	9, 000	. 0008	....	
38, 290	10, 000	. 0009	. 0003	
42, 119	11, 000	. 0025	....	
45, 948	12, 000	. 0031	....	
49, 777	13, 000	. 0036	....	
53, 606	14 000	. 0040	....	
57, 435	15, 000	. 0046	. 0036	
61, 264	16, 000	. 0048	....	
65, 093	17, 000	. 0058	....	
68, 922	18, 000	. 0060	....	
72, 751	19, 000	. 0074	....	
76, 580	20, 000	. 0078	. 0060	
80, 409	21, 000	. 0087	....	
84, 238	22, 000	. 0098	....	
88, 067	23, 000	. 0110	....	
91, 896	24, 000	. 0125	....	
95, 725	25, 000	. 0138	. 0103	
99, 554	26, 000	. 0186	....	
103, 383	27, 000	. 0270	....	
107, 212	28, 000	. 0365	....	
111, 041	29, 000	. 0456	....	
114, 870	30, 000	. 0555	. 0484	
118, 699	31, 000	. 0680	....	Edges contract and scale starts.
122, 528	32, 000	. 0806	....	
126, 357	33, 000	. 0975	....	
130, 186	34, 000	. 1290	....	
134, 015	45, 000	. 17	....	
137, 844	36, 000	. 20	....	
141, 673	37, 000	. 22	....	
145, 502	38, 000	. 27	....	
149, 331	39, 000	. 30	....	
152, 300	39, 780	. 35	....	Tensile strength.

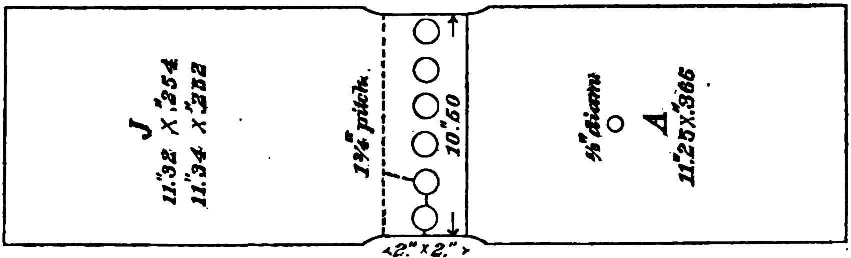
Sheared simultaneously all six rivets between plate and upper cover.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39, 780
Tension on net section of plate	61, 910
Compression on bearing surface of rivets	111, 250
Shearing on rivets	41, 360

Elongation of rivet holes, ″.25, ″.21, ″.20, ″.19, ″.21, ″.26.

No. 1359.

($\frac{3}{8}''$ steel plate.)



($\frac{9}{16}$ iron rivets; $\frac{5}{8}''$ drilled holes; $1\frac{3}{4}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.843
Net sectional area of plate	2.471
Bearing surface of rivets	1.372
Shearing area of rivets	3.682

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,843	1,000	0.	0.	Initial load.
7,686	2,000	0.		
11,529	3,000	0.		
15,372	4,000	.0002		
19,215	5,000	.0003	.0002	
23,058	6,000	.0004	....	
26,901	7,000	.0005	....	
30,744	8,000	.0006	....	
34,587	9,000	.0007	....	
38,430	10,000	.0011	.0006	
42,273	11,000	.0018	....	
46,116	12,000	.0042	....	
49,959	13,000	.0047	....	
53,802	14,000	.0052	....	
57,645	15,000	.0055	.0045	
61,488	16,000	.0060	....	
65,331	17,000	.0065	....	
69,174	18,000	.0070	....	
73,017	19,000	.0075	....	
76,860	20,000	.0085	.0063	
80,703	21,000	.0095	....	
84,546	22,000	.0107	....	
88,389	23,000	.0117	....	
92,232	24,000	.0130	....	
96,075	25,000	.0145	.0109	
99,918	26,000	.0184	....	
103,761	27,000	.0274	....	
107,604	28,000	.0365	....	
111,447	29,000	.0455	....	
115,290	30,000	.0555	.0488	
119,133	31,000	.0683	....	Edges contract.
122,976	32,000	.0794	....	
126,819	33,000	.1045	....	
130,662	34,000	.13	....	Scale starts.
134,505	35,000	.16	....	
138,348	36,000	.19	....	
142,191	37,000	.22	....	
146,034	38,000	.27	....	
149,877	39,000	.31	....	
150,100	39,060	....	....	Tensile strength.

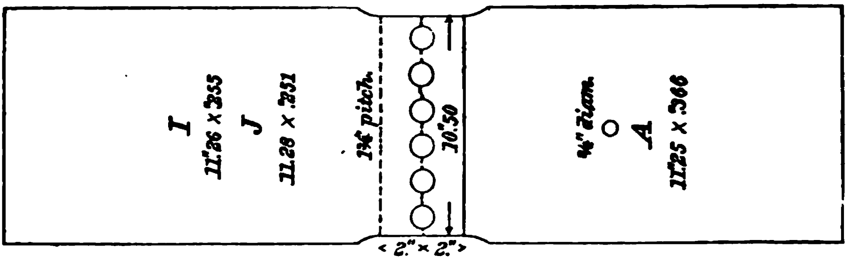
Sheared four rivets (double shear) and fractured the plate at two sections. Appearance of fracture silky, laminated.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,060
Tension on net section of plate	60,740
Compression on bearing surface of rivets	109,400
Shearing on rivets	40,770

Elongation of rivet holes, ".45, ".48, ".50, ".53.

No. 1360.

(⅜" steel plate.)



(1 1/16" iron rivets; ¾" drilled holes; 1¾" pitch).

Areas.	Square inches.
Gross sectional area of plate	3.843
Net sectional area of plate	2.196
Bearing surface of rivets	1.647
Shearing area of rivets	5.300

A load of 11,000 pounds per square inch applied and released before micrometer readings were taken.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
3,843	1,000	0.	0.	Initial load.
7,686	2,000	.0000	....	
11,529	3,000	.0000	....	
15,372	4,000	.0001	....	
19,215	5,000	.0001	0.	
23,058	6,000	.0001	....	
26,901	7,000	.0002	....	
30,744	8,000	.0002	....	
34,587	9,000	.0002	....	
38,430	10,000	.0002	0.	
42,273	11,000	.0003	....	
46,116	12,000	.0004	....	
49,959	13,000	.0018	....	
53,802	14,000	.0025	....	
57,645	15,000	.0030	.0027	
61,488	16,000	.0034	....	
65,331	17,000	.0038	....	
69,174	18,000	.0043	....	
73,017	19,000	.0049	....	
76,860	20,000	.0052	.0045	
80,703	21,000	.0060	....	
84,546	22,000	.0069	....	
88,389	23,000	.0080	....	
92,232	24,000	.0095	....	
96,075	25,000	.0107	.0089	
99,918	26,000	.0130	....	
103,761	27,000	.0172	....	
107,604	28,000	.0194	....	
111,447	29,000	.0266	....	
115,290	30,000	.0375	.0330	Edges contract.
119,133	31,000	.0502	....	
122,976	32,000	.0650	....	
126,819	33,000	.0830	....	Scale starts.
130,662	34,000	.127	....	
134,505	35,000	.18	....	
138,348	36,000	.20	....	
142,191	37,000	.28	....	Tensile strength.

Fractured plate along line of riveting. Appearance silky, exceedingly lamellar.

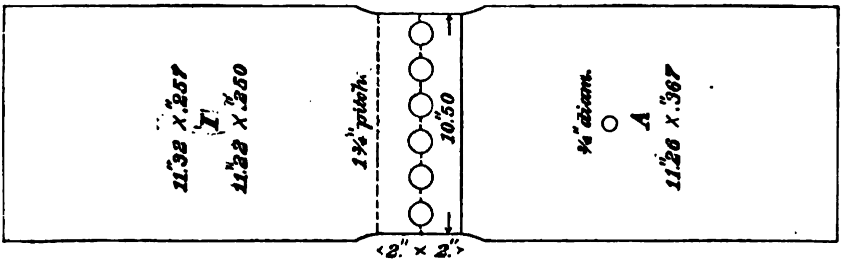
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37,000
Tension on net section of plate	64,750
Compression on bearing surface of rivets	86,330
Shearing on rivets	26,830

Elongation of rivet holes, ".51, ".49, ".48, ".47, ".48, ".50.

Open at edges, ".05 each.

No. 1361.

(⅜" steel plate.)



(1 1/16" iron rivets; ¾" drilled holes; 1¾" pitch.)

Areas.	Square inches.
Gross sectional area of plate	3.854
Net sectional area of plate	2.202
Bearing surface of rivets	1.652
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch*	
3,854	1,000	0.	0.	Initial load.
7,708	2,000	.0001		
11,562	3,000	.0002		
15,416	4,000	.0003		
19,270	5,000	.0005	.0001	
23,124	6,000	.0007		
26,978	7,000	.0012		
30,832	8,000	.0017		
34,686	9,000	.0022		
38,540	10,000	.0029	.0017	
42,394	11,000	.0039		
46,248	12,000	.0049		
50,102	13,000	.0060		
53,956	14,000	.0067		
57,810	15,000	.0072	.0051	
61,664	16,000	.0080		
65,518	17,000	.0085		
69,372	18,000	.0091		
73,226	19,000	.0097		
77,080	20,000	.0107	.0072	
80,934	21,000	.0118		
84,788	22,000	.0129		
88,642	23,000	.0141		
92,496	24,000	.0151		
96,350	25,000	.0163	.0113	
100,204	26,000	.0183		
104,058	27,000	.0200		
107,912	28,000	.0229		
111,766	29,000	.0298		
115,620	30,000	.0403	.0333	
119,474	31,000	.0535		Edges contract.
123,328	32,000	.0670		
127,182	33,000	.0868		
131,036	34,000	.1190		Scale starts
134,890	35,000	.16		
138,744	36,000	.20		
142,598	37,000	.26		
142,780	37,050	.29		Tensile strength

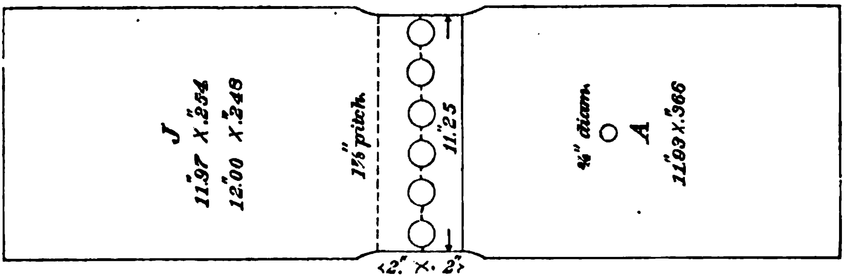
Simultaneous fracture along line of riveting. Appearance silky, very lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37,050
Tension on net section of plate	64,840
Compression on bearing surface of rivets	86,430
Shearing on rivets	26,940

Elongation of rivet holes, ".53, ".52, ".50, ".49, ".51, ".53.
Open at edges ".07 each.

No. 1362.

(⅜″ steel plate.)



(11/16″ iron rivets; ¾″ drilled holes; 1⅞″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	4.118
Net sectional area of plate	2.471
Bearing surface of rivets	1.647
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,118	1,000	0.	0.	Initial load.
8,236	2,000	0.	....	
12,354	3,000	0.	....	
16,472	4,000	.0001	....	
20,590	5,000	.0002	0.	
24,708	6,000	.0003	....	
28,826	7,000	.0005	....	
32,944	8,000	0008	....	
37,062	9,000	0013	....	
41,180	10,000	.0020	.0015	
45,298	11,000	.0025	....	
49,416	12,000	.0037	....	
53,534	13,000	0047	....	
57,652	14,000	0055	....	
61,770	15,000	0060	.0049	
65,888	16,000	.0064	....	
70,006	17,000	.0068	....	
74,124	18,000	.0072	....	
78,242	19,000	.0078	....	
82,360	20,000	.0084	.0065	
86,478	21,000	.0094	....	
90,596	22,000	0103	....	
94,714	23,000	.0109	....	
98,832	24,000	.0125	....	
102,950	25,000	.0144	.0115	
107,068	26,000	.0165	....	
111,186	27,000	.0190	....	
115,304	28,000	.0250	....	
119,422	29,000	.0465	....	Edges contract.
123,540	30,000	.0658	.0595	Load released, and joint rested twenty-four hours under no load.
127,658	31,000	.0723	....	
131,776	32,000	.0818	....	Scale starts.
135,896	33,000	.120	....	
140,014	34,000	.18	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
144,132	35,000	.20	....	
148,248	36,000	.23	....	
152,366	37,000	.28	....	
154,200	37,450	.35	....	Tensile strength.

Fractured along line of riveting, beginning at the east edge. Appearance silky, exceedingly lamellar.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	37,450
Tension on net section of plate	62,400
Compression on bearing surface of rivets	93,620
Shearing on rivets	29,090

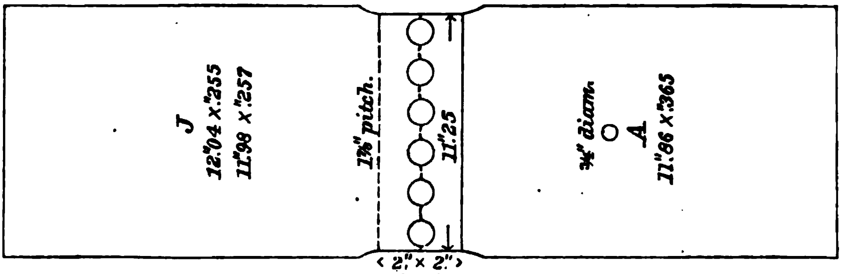
Elongation of rivet holes, ".44, ".41, ".40, ".41, ".42, ".45.
Open at edges ".07 each.

Fractured areas.

	Square inch.
".43 × ".24 =	.1032
.97 × .22 =	.2134
.96 × .23 =	.2208
.98 × .21 =	.2058
.97 × .23 =	.2231
.98 × .21 =	.2058
.38 × .25 =	.0950
	1.2671 Contraction, 48.7 per cent.

No. 1363.

(⅜″ steel plate.)



(11/16″ iron rivets; ¾″ drilled holes; 1⅞″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.106
Net sectional area of plate	2.464
Bearing surface of rivets	1.642
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4, 106	1, 000	0.	0.	Initial load.
8, 212	2, 000	.0002	....	
12, 318	3, 000	.0002	....	
16, 424	4, 000	.0004	....	
20, 530	5, 000	.0005	.0003	
24, 636	6, 000	.0006	....	
28, 742	7, 000	.0009	....	
32, 848	8, 000	.0011	....	
36, 954	9, 000	.0015	....	
41, 060	10, 000	.0022	.0015	
45, 166	11, 000	.0040	....	
49, 272	12, 000	.0052	....	
53, 378	13, 000	.0058	....	
57, 484	14, 000	.0064	....	
61, 590	15, 000	.0067	.0052	
65, 696	16, 000	.0072	....	
69, 803	17, 000	.0077	....	
73, 908	18, 000	.0085	....	
78, 014	19, 000	.0090	....	
82, 120	20, 000	.0100	.0075	
86, 226	21, 000	.0110	....	
90, 332	22, 000	.0120	....	
94, 438	23, 000	.0135	....	
98, 544	24, 000	.0145	....	
102, 650	25, 000	.0153	.0117	
106, 756	26, 000	.0168	....	
110, 862	27, 000	.0182	....	
114, 968	28, 000	.0220	....	
119, 074	29, 000	.0303	....	
123, 180	30, 000	.0425	.0367	Edges contract.
127, 286	31, 000	.0576	....	
131, 392	32, 000	.0750	....	Scale starts.
135, 498	33, 000	.0950	....	
139, 604	34, 000	.120	....	
143, 710	35, 000	.16	....	
147, 816	36, 000	.20	....	
151, 922	37, 000	.23	....	
156, 028	38, 000	.32	....	
156, 200	38, 040	.33	....	Tensile strength.

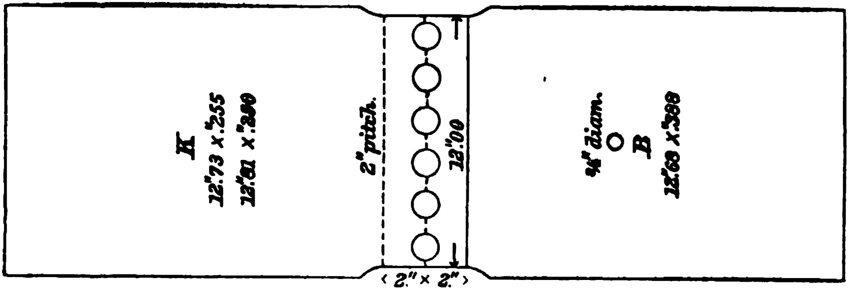
Fractured plate along line of riveting, beginning at the east edge. Appearance silky, exceedingly lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	38, 040
Tension on net section of plate	63, 390
Compression on bearing surface of rivets	95, 130
Shearing on rivets	29, 470

Elongation of rivet holes, ″.47, ″.45, ″.43, ″.43, ″.44, ″.46.
Open at edges, ″.05 and ″.12.

No. 1364.

(⅜″ steel plate.)



(1 1/16 iron rivets; ¾ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.656
Net sectional area of plate	2.910
Bearing surface of rivets	1.740
Shearing area of rivets	5.306

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,656	1,000	0.	0.	Initial load.
9,312	2,000	.0001		
13,968	3,000	.0001		
18,624	4,000	.0002		
23,280	5,000	.0003	.0001	
27,936	6,000	.0005		
32,592	7,000	.0008		
37,248	8,000	.0013		
41,904	9,000	0026		
46,560	10,000	.0036	.0028	
51,216	11,000	0046		
55,872	12,000	.0052		
60,528	13,000	.0058		
65,184	14,000	0063		
69,840	15,000	.0070	0054	
74,496	16,000	.0074		
79,152	17,000	.0081		
83,808	18,000	.0091		
88,464	19,000	.0101		
93,120	20,000	.0111	.0084	
97,776	21,000	.0124		
102,432	22,000	.0131		
107,088	23,000	.0141		
111,744	24,000	.0153		
116,400	25,000	.0166	.0118	
121,056	26,000	.0198		
125,712	27,000	.0266		
130,368	28,000	.0376		
135,024	29,000	.0480		Edges contract.
139,680	30,000	.0573	.0479	
144,336	31,000	.0690		
148,992	32,000	.0810		
153,648	33,000	.0935		Scale starts.
158,304	34,000	.1130		
162,960	35,000	.14		
167,616	36,000	.18		
172,272	37,000	.20		
176,928	38,000	.22		
181,584	39,000	.26		
186,240	40,000	.32		
190,896	41,000	.38		Scale starts off one cover.
194,700	41,820	.45		Tensile strength.

Fractured plate along line of riveting, beginning at the west edge. Appearance silky.

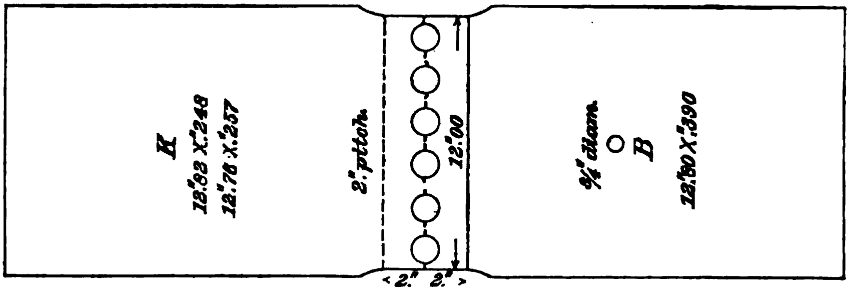
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41,820
Tension on net section of plate	66,910
Compression on bearing surface of rivets	111,510
Shearing on rivets	36,730

Elongation of rivet holes, ″.65, ″.63, ″.59, ″.61, ″.63, ″.66.

Open at edges, ″.15 each.

No. 1365.

($\frac{3}{8}''$ steel plate.)



($\frac{11}{16}$ iron rivets; $\frac{3}{4}$ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.680
Net sectional area of plate	2.925
Bearing surface of rivets	1.750
Shearing area of rivets	5.305

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,680	1,000	0.	0.	Initial load.
9,360	2,000	.0001	....	
14,040	3,000	.0002	....	
18,720	4,000	.0003	....	
23,400	5,000	.0004	0.	
28,080	6,000	.0005	....	
32,760	7,000	.0008	....	
37,440	8,000	.0011	....	
42,120	9,000	.0017	....	
46,800	10,000	.0032	.0022	
51,480	11,000	.0050	....	
56,160	12,000	.0055	....	
60,840	13,000	.0060	....	
65,520	14,000	.0065	....	
70,200	15,000	.0070	.0051	
74,880	16,000	.0075	....	
79,560	17,000	.0080	....	
84,240	18,000	.0088	....	
88,920	19,000	.0095	....	
93,600	20,000	.0105	.0075	
98,280	21,000	.0117	....	
102,960	22,000	.0124	....	
107,640	23,000	.0137	....	
112,320	24,000	.0150	....	
117,000	25,000	.0170	.0119	
121,680	26,000	.0217	....	
126,360	27,000	.0305	....	
131,040	28,000	.0435	....	
135,720	29,000	.0530	....	Edges contract.
140,400	30,000	.0625	.0524	
145,080	31,000	.0740	....	Scale starts.
149,760	32,000	.0870	....	
154,440	33,000	.100	....	
159,120	34,000	.13	....	
163,800	35,000	.16	....	
168,480	36,000	.18	....	
173,160	37,000	.20	....	
177,840	38,000	.22	....	
182,520	39,000	.27	....	
187,200	40,000	.30	....	
191,880	41,000	.37	....	
196,560	42,000	.46	....	Tensile strength.

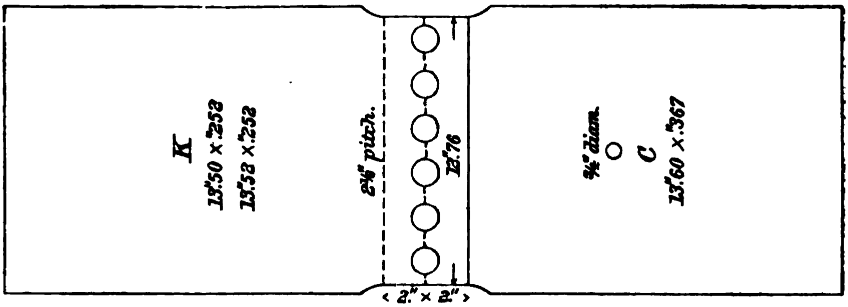
Fractured plate along line of riveting, beginning at the east edge.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	42,000
Tension on net section of plate	67,200
Compression on bearing surface of rivets	112,000
Shearing on rivets	37,000

Elongation of rivet holes, ″.66, ″.60, ″.57, ″.57, ″.57, ″.55.
Open at edges, ″.15 and ″.07.

No. 1366.

(⅜" steel plate.)



(1 1/16" iron rivets; ¾ drilled holes; 2⅛" pitch.)

Areas.	Square inches
Gross sectional area of plate	4.683
Net sectional area of plate	3.031
Bearing surface of rivets	1.652
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,683	1,000	0.	0.	Initial load.
9,366	2,000	—.0010		Joint convex on side micrometer measurements were taken.
14,049	3,000	—.0017		
18,732	4,000	—.0019		
23,415	5,000	—.0021	—.0001	
28,098	6,000	—.0019		
32,781	7,000	—.0019		
37,464	8,000	—.0017		
42,147	9,000	—.0012		
46,830	10,000	—.0005	.0021	
51,513	11,000	.0016		
56,196	12,000	.0017		
60,879	13,000	.0020		
65,562	14,000	.0022		
70,245	15,000	.0026	.0050	
74,928	16,000	.0034		
79,611	17,000	.0041		
84,294	18,000	.0051		
88,977	19,000	.0061		
93,660	20,000	.0073	.0083	
98,343	21,000	.0091		
103,026	22,000	.0101		
107,709	23,000	.0114		
112,392	24,000	.0126		
117,075	25,000	.0155	.0146	
121,758	26,000	.0243		
126,441	27,000	.0396		
131,124	28,000	.0520		Edges contract and scale starts.
135,807	29,000	.0640		
140,490	30,000	.0754	.0691	
145,173	31,000	.0920		
149,856	32,000	.106		
154,539	33,000	.13		
159,222	34,000	.15		
163,905	35,000	.17		
168,588	36,000	.20		
173,271	37,000	.23		
177,954	38,000	.27		
182,637	39,000	.32		
187,320	40,000	.39		
192,003	41,000	.48		
192,200	41,040	.50		Tensile strength.

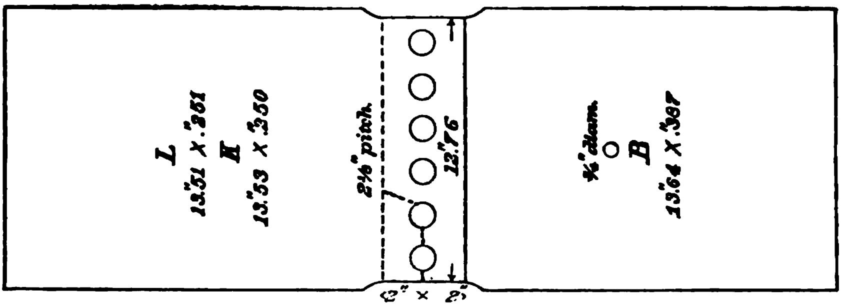
Fractured plate along line of riveting, beginning at the west edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	41,040
Tension on net section of plate	63,410
Compression on bearing surface of rivets	116,340
Shearing on rivets	36,260

Elongation of rivet holes, ".67, ".61, ".56, ".56, ".59, ".61.
Open at edges, ".25 and ".20.

No. 1367.

(⅜" steel plate.)



($\frac{11}{16}$" iron rivets; ¾' drilled holes 2⅛' pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.938
Net sectional area of plate	3.197
Bearing surface of rivets	1.741
Shearing area of rivets	5.300

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,938	1,000	0.	0.	Initial load.
9,876	2,000	.0001		
14,814	3,000	.0002		
19,752	4,000	.0003		
24,690	5,000	.0005	0.	
29,628	6,000	.0007		
34,566	7,000	.0011		
39,504	8,000	.0016		
44,442	9,000	.0035		
49,380	10,000	.0048	.0036	
54,318	11,000	.0053		
59,256	12,000	.0059		
64,194	13,000	.0065		
69,132	14,000	.0070		
74,070	15,000	.0075	.0057	
79,008	16,000	.0082		
83,946	17,000	.0090		
88,884	18,000	.0100		
93,822	19,000	.0111		
98,760	20,000	.0123	.0090	
103,698	21,000	.0140		
108,636	22,000	.0155		
113,574	23,000	.0175		
118,512	24,000	.0204		
123,450	25,000	.0270	.0205	
128,388	26,000	.0415		
133,326	27,000	.0530		
138,264	28,000	.0620		Scale starts and edges contract.
143,202	29,000	.0732		
148,140	30,000	.0862	.0760	
153,078	31,000	.1010		
158,016	32,000	.11		
162,954	33,000	.14		
167,892	34,000	.16		
172,830	35,000	.18		
177,768	36,000	.21		
182,706	37,000	.23		
187,644	38,000	.28		
192,582	39,000	.32		
197,520	40,000	.36		
202,000	40,910	.44		Tensile strength.

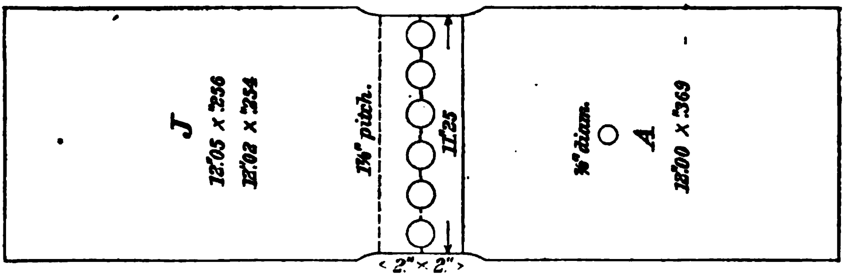
Sheared four rivets and fractured plate in two sections. Appearance silky.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	40,910
Tension on net section of plate	63,180
Compression on bearing surface of rivets	116,030
Shearing on rivets	38,110

Elongation of rivet holes, ".22, ".40, ".40, ".38.

No. 1368.

(⅜″ steel plate.)



($1\frac{3}{16}$ iron rivets; ⅞″ drilled holes; 1⅞″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.151
Net sectional area of plate	2.214
Bearing surface of rivets	1.937
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4, 151	1, 000	0.	0.	Initial load.
8, 302	2, 000	.0001	....	
12, 453	3, 000	.0003	....	
16, 604	4, 000	.0004	....	
20, 755	5, 000	.0008	.0001	
24, 906	6, 000	.0009	....	
29, 057	7, 000	.0013	....	
33, 208	8, 000	.0016	....	
37, 359	9, 000	.0020	....	
41, 510	10, 000	.0024	.0009	
45, 661	11, 000	.0029	....	
49, 812	12, 000	.0035	....	
53, 963	13, 000	.0042	....	
58, 114	14, 000	.0049	....	
62, 265	15, 000	.0059	.0033	
66, 416	16, 000	.0069	....	
70, 567	17, 000	.0077	....	
74, 718	18, 000	.0084	....	
78, 869	19, 000	.0089	....	
83, 020	20, 000	.0096	.0059	
87, 171	21, 000	.0106	....	
91, 322	22, 000	.0112	....	
95, 473	23, 000	.0122	....	
99, 624	24, 000	.0132	....	
103, 775	25, 000	.0148	.0096	
107, 926	26, 000	.0179	....	
112, 077	27, 000	.0204	....	
116, 228	28. 000	.0236	....	
120, 379	29, 000	.0280	....	
124, 530	30, 000	.0364	0292	Edges contract.
128, 681	31, 000	.0510	....	
132, 832	32, 000	.0633	....	Scale starts.
136, 983	33, 000	.0850	....	
141, 134	34, 000	.1210	....	
145, 285	35, 000	.20	....	Tensile strength.

Fractured plate along line of rivet holes, beginning at the east edge. Appearance silky, lamellar.

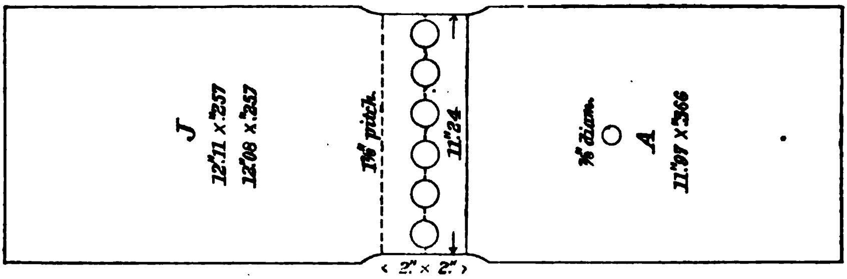
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	35, 000
Tension on net section of plate	65, 620
Compression on bearing surface of rivets	75, 006
Shearing on rivets	20, 130

Elongation of rivet holes, ″.38, ″.38, ″.35, ″.34, ″.33, ″.34.

Open at edges, ″.15 and ″.12.

No. 1369.

(⅜″ steel plate.)



($\frac{13}{16}$ iron rivets; ⅞″ drilled holes; 1⅞″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	4.114
Net sectional area of plate	2.192
Bearing surface of rivets	1.922
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,114	1,000	0.	0.	Initial load.
8,228	2,000	.0001	....	
12,342	3,000	.0002	....	
16,456	4,000	.0004	....	
20,570	5,000	.0005	.0000	
24,684	6,000	.0006	....	
28,798	7,000	.0007	....	
32,912	8,000	.0012	....	
37,026	9,000	.0019	....	
41,140	10,000	.0029	.0019	
45,254	11,000	.0038	....	
49,368	12,000	.0047	....	
53,482	13,000	.0053	....	
57,596	14,000	.0059	....	
61,710	15,000	.0064	.0046	
65,824	16,000	.0070	....	
69,938	17,000	.0075	....	
74,052	18,000	.0080	....	
78,166	19,000	.0085	....	
82,280	20,000	.0090	.0062	
86,394	21,000	.0102	....	
90,508	22,000	.0112	....	
94,622	23,000	.0129	....	
98,736	24,000	.0154	....	
102,850	25,000	.0181	.0140	
106,964	26,000	.0215	....	
111,078	27,000	.0254	....	Edges contract.
115,192	28,000	.0367	....	
119,306	29,000	.0400	....	
123,420	30,000	.0495	....	Scale starts.
127,534	31,000	.0670	....	
131,648	32,000	.093	....	
135,762	33,000	.127	....	
139,876	34,000	.19	....	
140,600	34,180	.22	....	Tensile strength.

Simultaneous fracture of plate along line of riveting. Appearance silky, lamellar.

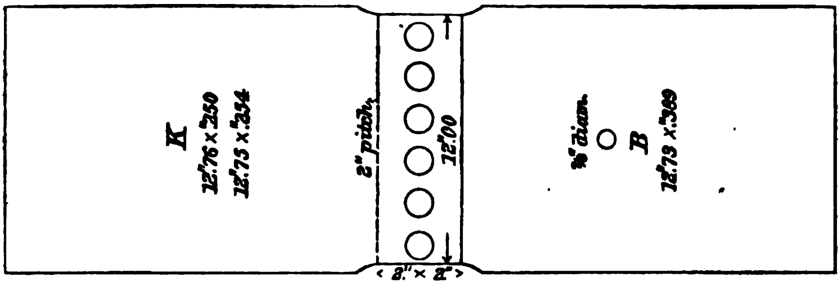
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	34,180
Tension on net section of plate	64,140
Compression on bearing surface of rivets	73,150
Shearing on rivets	19,480

Elongation of rivet holes, ″.38, ″.36, .32, ″.32″, ″.33, ″.33.
Open at edges, ″.10 and ″.07.

No. 1370.

(⅜″ steel plate.)



(1 3/16 iron rivets; ⅞″ drilled holes; 2″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	4.668
Net sectional area of plate	2.626
Bearing surface of rivets	2.042
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,668	1,000	0.	0.	Initial load.
9,336	2,000	.0001	....	
14,004	3,000	.0002	....	
18,672	4,000	.0003	....	
23,340	5,000	.0004	.0001	
28,008	6,000	.0005	....	
32,676	7,000	.0006	....	
37,344	8,000	.0010	....	
42,012	9,000	.0014	....	
46,680	10,000	.0018	.0012	
51,348	11,000	.0023	....	
56,016	12,000	.0028	....	
60,684	13,000	.0032	....	
65,352	14,000	.0039	....	
70,020	15,000	.0048	.0037	
74,688	16,000	.0036	....	
79,356	17,000	.0061	....	
84,024	18,000	.0070	....	
88,692	19,000	.0076	....	
93,360	20,000	.0086	.0050	
98,028	21,000	.0097	....	
102,696	22,000	.0105	....	
107,364	23,000	.0114	....	
112,032	24,000	.0126	....	
116,700	25,000	.0146	.0097	
121,368	26,000	.0162	....	
126,036	27,000	.0189	....	
130,704	28,000	.0218	....	
135,372	29,000	.0257	....	
140,040	30,000	.0342	0257	
144,708	31,000	.0440	....	
149,376	32,000	.0615	....	Edges contract and scale starts.
154,044	33,000	.083	....	
158,712	34,000	.103	....	
163,380	35,000	.137	....	
168,048	36,000	.18	....	
172,100	36,870	.20	....	Tensile strength.
120,000	....	....	....	When the load had fell to this limit, fracture being in progress along line of riveting, test was discontinued.

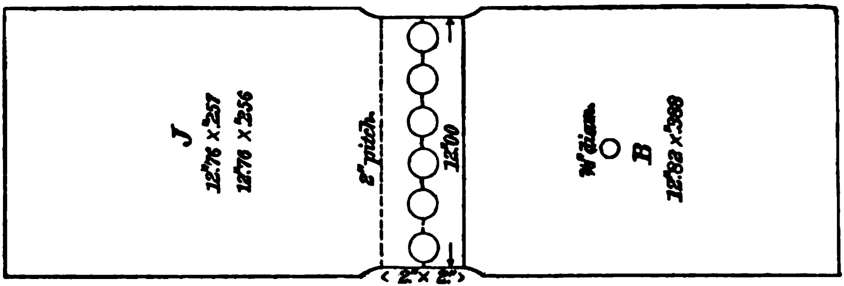
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	36,870
Tension on net section of plate	65,540
Compression on bearing surface of rivets	84,280
Shearing on rivets	23,850

Elongation of rivet holes, ″.14, ″.15, ″.12, ″.13, ″.14, .″14.

No. 1371.

(⅜″ steel plate.)



(15/16″ iron rivets; ⅞″ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.656
Net sectional area of plate	2.619
Bearing surface of rivets	2.037
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,656	1,000	0.	0.	Initial load.
9,312	2,000	0.		
13,968	3,000	.0001		
18,624	4,000	.0002		
23,280	5,000	.0003	0.	
27,936	6,000	.0004		
32,592	7,000	.0005		
37,248	8,000	.0009		
41,904	9,000	.0011		
46,560	10,000	.0014	.0005	
51,216	11,000	.0020		
55,872	12,000	.0023		
60,528	13,000	.0026		
65,184	14,000	.0037		
69,840	15,000	.0053	.0032	
74,496	16,000	.0064		
79,152	17,000	.0070		
83,808	18,000	.0075		
88,464	19,000	.0080		
93,020	20,000	.0085	.0055	
97,776	21,000	.0095		
102,432	22,000	.0101		
107,088	23,000	.0110		
111,744	24,000	.0115		
116,400	25,000	.0125	.0062	
121,056	26,000	.0135		
125,712	27,000	.0145		
130,368	28,000	.0155		
135,024	29,000	.0175		
139,680	30,000	.0235	.0166	
144,336	31,000	.0327		Edges contract.
148,992	32,000	.0390		
153,648	33,000	.0550		
158,304	34,000	.0770		Scale starts.
162,960	35,000	.105		
167,616	36,000	.14		
172,272	37,000	.17		
176,928	38,000	.20		
181,300	38,940	.27		Tensile strength.

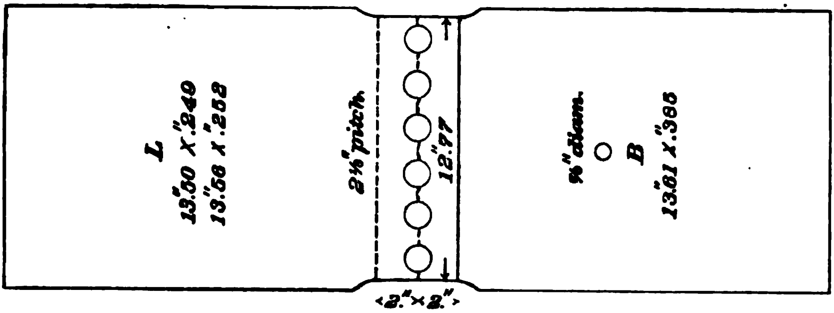
Fractured plate along line of riveting, beginning at the east edge. Appearance silky, slight lamination.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	38,940
Tension on net section of plate	69,220
Compression on bearing surface of rivets	89,000
Shearing on rivets	25,120

Elongation of inch sections, ″.43, ″.41, ″.36, ″.38, ″.40, ″.43.
Open at edges ″.05 and ″.10.

No. 1372.

($\frac{3}{8}$" steel plate.)



($1\frac{3}{16}$" iron rivets; $\frac{7}{8}$ drilled holes; $2\frac{1}{8}$" pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.916
Net sectional area of plate	2.895
Bearing surface of rivets	2.021
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4, 916	1, 000	0.	0.	Initial load.
9, 832	2, 000	.0001	....	
14, 748	3, 000	.0002	....	
19, 664	4, 000	.0004	....	
24, 580	5, 000	.0006	.0001	
29, 496	6, 000	.0008	....	
34, 412	7, 000	.0013	....	
39, 328	8, 000	.0018	....	
44, 244	9, 000	.0023	....	
49, 160	10, 000	.0028	.0016	
54, 076	11, 000	.0036	....	
58, 992	12, 000	0044	....	
63, 908	13, 000	.0052	....	
68, 824	14, 000	.0059	....	
73, 740	15, 000	.0067	.0042	
78, 656	16, 000	.0077	....	
83. 572	17, 000	.0086	....	
88, 488	18, 000	.0095	....	
93, 404	19, 000	.0102	....	
98, 320	20, 600	.0111	.0071	
103, 236	21, 000	.0123	....	
108, 152	22, 000	.0133	....	
113, 068	23, 000	.0146	....	
117, 984	24, 000	.0167	....	
122, 900	25, 000	.0194	.0134	
127, 816	26, 000	.0241	....	
132, 732	27, 000	.0281	....	
137, 648	28, 000	.0335	....	Edges contract.
142, 564	29, 000	.0460	....	Scale starts.
147, 480	30, 000	.0576	.0486	
152, 396	31, 000	.0776	....	
157, 312	32, 000	.0950	....	
162, 228	33, 000	.112	....	
167, 144	34, 000	.14	....	
172, 060	35, 000	.16	....	
176, 976	36, 000	.19	....	
181, 892	37, 000	.22	....	
186, 808	38, 000	.28	....	
190, 400	38, 730	.37	....	Tensile strength.

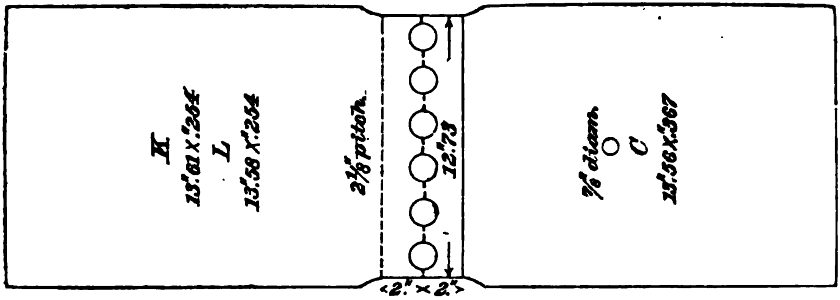
Fractured plate along line of riveting, beginning at the west edge. Appearance silky, slight lamination.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	38, 730
Tension on net section of plate	65, 770
Compression on bearing surface of rivets	94, 210
Shearing on rivets	26, 390

Elongation of rivet holes, ".49, ".49, ".45, ".43, ".48, ".49.
Open at edges, ".12 and ".10.

No. 1373.

($\frac{3}{8}''$ steel plate.)



($\frac{13}{16}''$ iron rivets; $\frac{7}{8}''$ drilled holes; $2\frac{1}{8}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.672
Net sectional area of plate	2.745
Bearing surface of rivets	1.927
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,672	1,000	0.	0.	Initial load.
9,344	2,000	.0001		
14,016	3,000	.0001		
18,688	4,000	.0002		
23,360	5,000	.0003	0.	
28,032	6,000	.0006		
32,704	7,000	.0009		
37,376	8,000	.0012		
42,048	9,000	.0017		
46,720	10,000	.0022	.0017	
51,392	11,000	.0025		
56,064	12,000	.0028		
60,736	13,000	.0035		
65,408	14,000	.0038		
70,080	15,000	.0040	.0033	
74,752	16,000	.0043		
79,424	17,000	.0047		
84,096	18,000	.0053		
88,768	19,000	.0061		
93,440	20,000	.0073	.0060	
98,112	21,000	.0079		
102,784	22,000	.0088		
107,456	23,000	.0095		
112,128	24,000	.0104		
116,800	25,000	.0114	.0088	
121,472	26,000	.0135		
126,144	27,000	.0158		
130,816	28,000	.0187		
135,488	29,000	.0238		
140,160	30,000	.0305	.0255	
144,832	31,000	.0500		Edges contract.
149,504	32,000	.0630		
154,176	33,000	.0840		
158,848	34,000	.103		Scale starts.
163,520	35,000	.12		
168,192	36,000	.15		
172,864	37,000	.18		
177,536	38,000	.21		
182,208	39,000	.28		
182,250	39,010	.30		Tensile strength.

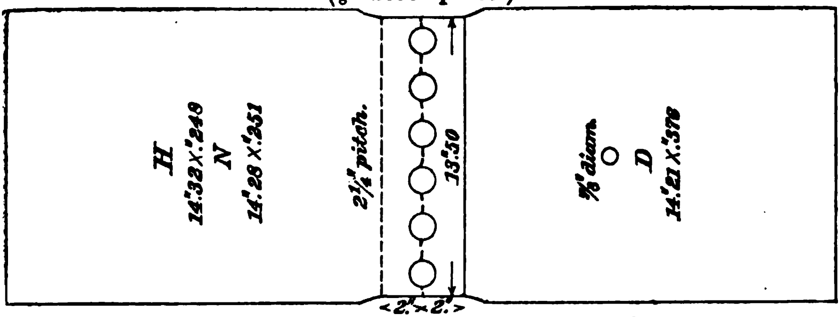
Fractured plate along line of riveting, beginning at the west edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch
Tension on gross section of plate	39,010
Tension on net section of plate	65,660
Compression on bearing surface of rivets	94,580
Shearing on rivets	25,260

Elongation of rivet holes, ".49, ".47, ".42, ".45, ".46, ".49.
Open at edges, ".12 and ".10.

No. 1374.

(⅜″ steel plate.)



(13/16″ iron rivets; ⅞″ drilled holes; 2¼″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.076
Net sectional area of plate	3.102
Bearing surface of rivets	1.974
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,076	1,000	0.	0.	Initial load.
10,152	2,000	.0001	....	
15,228	3,000	.0002	....	
20,304	4,000	.0003	....	
25,380	5,000	.0005	.0003	
30,456	6,000	.0006	....	
35,532	7,000	.0008	....	
40,608	8,000	.0011	....	
45,684	9,000	.0014	....	
50,760	10,000	.0018	.0066	
55,836	11,000	.0024	....	
60,912	12,000	.0029	....	
65,988	13,000	.0034	....	
71,064	14,000	.0040	....	
76,140	15,000	.0049	.0038	
81,216	16,000	.0059	....	
86,292	17,000	.0068	....	
91,368	18,000	.0075	....	
96,444	19,000	.0080	....	
101,520	20,000	.0089	.0064	
106,596	21,000	.0100	....	
111,672	22,000	.0109	....	
116,748	23,000	.0119	....	
121,824	24,000	.0134	....	
126,900	25,000	.0148	.0099	
131,976	26,000	.0173	....	
137,052	27,000	.0196	....	Scale starts and edges contract.
142,128	28,000	.0239	....	
147,204	29,000	.0359	....	
152,280	30,000	.0522	.0434	
157,356	31,000	.0675	....	
162,432	32,000	.0840	....	
167,508	33,000	.107	....	
172,584	34,000	.14	....	
177,660	35,000	.16	....	
182,736	36,000	.18	....	
187,812	37,000	.21	....	
192,700	37,960	.29	....	Tensile strength.

Fractured plate along line of riveting, beginning at the west edge. This edge opened ¼″ before the final separation of the plate.

Appearance silky, very lamellar.

Maximum stress on joint.

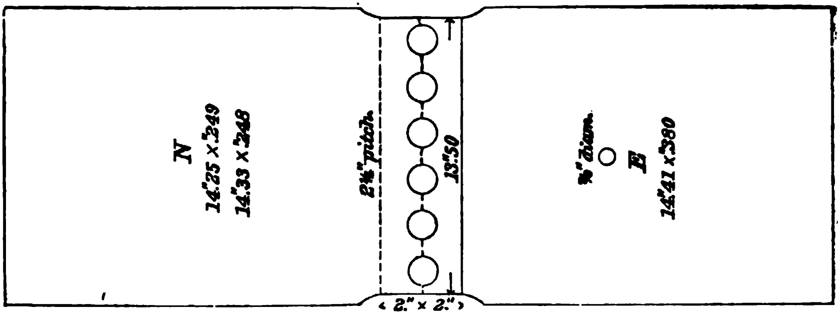
	Pounds per square inch.
Tension on gross section of plate	37,960
Tension on net section of plate	62,120
Compression on bearing surface of rivets	97,620
Shearing on rivets	26,700

Elongation of rivet holes, ″.58, ″.51, ″.47, ″.47, ″.50, ″.52.

Open at edges, ″.25 and ″.05.

No. 1375.

(⅜" steel plate.)



(1 3/16 iron rivets; ⅞" drilled holes; 2¼" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.130
Net sectional area of plate	3.135
Bearing surface of rivets	1.995
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5, 130	1, 000	0.	0.	Initial load.
10, 260	2, 000	.0001	....	
15, 390	3, 000	.0002	....	
20, 520	4, 000	.0005	....	
25, 650	5, 000	.0007	.0001	
30, 780	6, 000	.0011	....	
35, 910	7, 000	.0014	....	
41, 040	8, 000	.0018	....	
46, 170	9, 000	.0021	....	
51, 300	10, 000	.0031	.0011	
56, 430	11, 000	.0046	....	
61, 560	12, 000	.0061	....	
66, 690	13, 000	.0066	....	
71, 820	14, 000	.0076	....	
76, 950	15, 000	.0083	.0054	
82, 080	16, 000	.0090	....	
87, 210	17, 000	.0096	....	
92, 340	18, 000	.0103	....	
97, 470	19, 000	.0108	....	
102, 600	20, 000	.0115	.0066	
107, 730	21, 000	.0125	....	
112, 860	22, 000	.0131	....	
117, 990	23, 000	.0141	....	
123, 120	24, 000	.0151	....	
128, 250	25, 000	.0171	.0108	
133, 380	26, 000	.0198	....	
138, 510	27, 000	.0221	....	
143, 640	28, 000	.0275	....	
148, 770	29, 000	.0467	....	
153, 900	30, 000	.0625	.0526	Edges contract and scale starts.
159, 030	31, 000	.0785	....	
164, 160	32, 000	.095	....	
169, 290	33, 000	.112	....	
174, 420	34, 000	.14	....	
179, 550	35, 000	.16	....	
184, 680	36, 000	.19	....	
189, 810	37, 000	.21	....	
194, 940	38, 000	.26	....	
200, 070	39, 000	.31	....	
204, 200	39, 810	.38	....	Tensile strength.

Fractured plate along line of riveting, beginning at the east edge. Appearance silky, slight lamination.

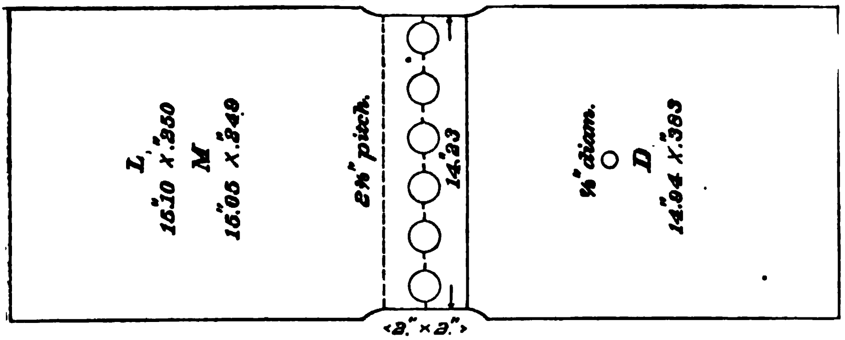
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	39, 810
Tension on net section of plate	65, 140
Compression on bearing surface of rivets	102, 360
Shearing on rivets	28, 300

Elongation of rivet holes, ".59, ".56, ".53, ".51, ".54, ".58.
Open at edges, ".15 and ".24.

No. 1376.

(⅜″ steel plate.)



(13/16 iron rivets; ⅞ drilled holes; 2⅜ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.450
Net sectional area of plate	3.439
Bearing surface of rivets	2.011
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,450	1,000	0.	0.	Initial load.
10,900	2,000	.0002	....	
16,350	3,000	.0005	....	
21,800	4,000	.0007	....	
27,250	5,000	.0011	.0004	
32,700	6,000	.0017	....	
38,150	7,000	.0025	....	
43,600	8,000	.0041	....	
49,050	9,000	.0051	....	
54,500	10,000	.0065	.0047	
59,950	11,000	.0075	....	
65,400	12,000	.0085	....	
70,850	13,000	.0092	....	
76,300	14,000	.0100	....	
81,750	15,000	.0110	.0080	
87,200	16,000	.0120	....	
92,650	17,000	.0129	....	
98,100	18,000	.0138	....	
103,550	19,000	.0148	....	
109,000	20,000	.0160	.0113	Rested under initial load fifteen hours.
114,450	21,000	.0176	....	
119,900	22,000	.0193	....	
125,350	23,000	.0219	....	
130,800	24,000	.0247	....	
136,250	25,000	.0293	.0217	
141,700	26,000	.0350	....	
147,150	27,000	.0415	....	
152,600	28,000	.0550	....	Edges contract.
158,050	29,000	.0720	....	Scale starts.
163,500	30,000	.0832	.0728	
168,950	31,000	.102	....	
174,400	32,000	.13	....	
179,850	33,000	.16	....	
185,300	34,000	.18	....	
190,750	35,000	.20	....	
196,200	36,000	.24	....	
201,650	37,000	.28	....	
207,100	38,000	.35	....	
212,100	38,920	.43	....	Tensile strength.

Fractured the plate along line of riveting. Fractured each edge before the middle of the joint separated. Appearance silky, laminated.

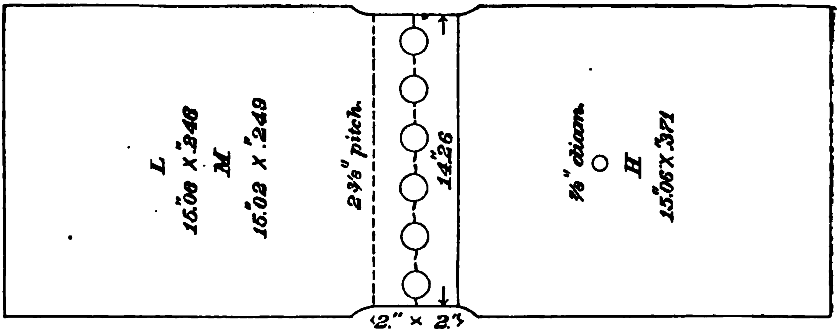
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	38,920
Tension on net section of plate	61,670
Compression on bearing surface of rivets	105,470
Shearing on rivets	29,390

Elongation of rivet holes, ″.72, ″.65, ″.64, ″.61, ″.64, ″.69.
Open at edges, ″.20 and ″.28.

No. 1377.

($\frac{3}{8}''$ steel plate.)



($\frac{13}{16}$ iron rivets; $\frac{7}{8}$ drilled holes; $2\frac{3}{8}$ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.290
Net sectional area of plate	3.342
Bearing surface of rivets	1.948
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,290	1,000	0.	0.	Initial load.
10,580	2,000	.0000	....	Joint convex on the micrometer side, causing minus readings as the plate straightened.
15,870	3,000	−.0005	....	
21,160	4,000	−.0007	....	
26,450	5,000	−.0008	.0001	
31,740	6,000	−.0011	....	
37,030	7,000	−.0008	....	
42,320	8,000	−.0004	....	
47,610	9,000	+.0005	....	
52,900	10,000	.0008	.0027	
58,190	11,000	.0018	....	
63,480	12,000	.0020	....	
68,770	13,000	.0022	....	
74,060	14,000	.0027	....	
79,350	15,000	.0032	.0052	
84,640	16,000	.0043	....	
89,930	17,000	.0052	....	
95,220	18,000	.0064	....	
100,510	19,000	.0074	....	
105,800	20,000	.0087	.0092	
111,090	21,000	.0103	....	
116,380	22,000	.0118	....	
121,670	23,000	.0140	....	
126,960	24,000	.0153	....	
132,250	25,000	.0170	.0152	
137,540	26,000	.0200	....	
142,830	27,000	.0240	....	
148,120	28,000	.0311	....	Edges contract and scale starts.
153,410	29,000	.0421	....	
158,700	30,000	.0600	.0539	
163,990	31,000	.0780	....	
169,280	32,000	.0995	....	
174,570	33,000	.121	....	
179,860	34,000	.15	....	
185,150	35,000	.18	....	
190,440	36,000	.21	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
195,730	37,000	.25	....	
201,020	38,000	.29	....	
206,310	39,000	.35	....	
210,900	39,870	.46	....	Tensile strength.

Fractured plate along line of riveting, beginning at the east edge. There was a seam in two fractured sections at this edge of the plate. The scale first started at this point.

Appearance of fracture silky, slightly lamellar.

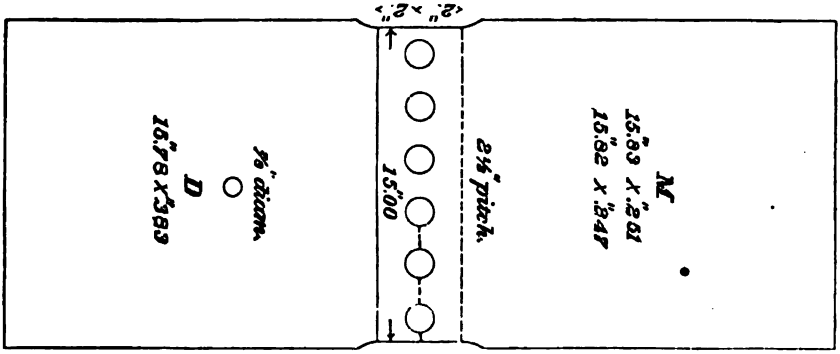
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	39,870
Tension on net section of plate	63,110
Compression on bearing surface of rivets	108,260
Shearing on rivets	29,230

Elongation of inch sections, ″.68, ″.61, ″.60, ″.58. ″.61, ″.67.
Open at edges, ″.10 and ″.20.

No. 1378.

(⅜″ steel plate.)



(1$\frac{3}{16}$ iron rivets; ⅞″ drilled holes; 2½″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.745
Net sectional area of plate	3.734
Bearing surface of rivets	2.011
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,745	1,000	.0	0.	Initial load.
11,490	2,000	.0001	....	
17,235	3,000	.0001	....	
22,980	4,000	.0002	....	
28,725	5,000	.0003	.0002	
34,470	6,000	.0004	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
40,215	7,000	.0011	....	
45,960	8,000	.0020	....	
51,705	9,000	.0026	....	
57,450	10,000	.0032	.0026	
63,195	11,000	.0039	....	
68,940	12,000	.0045	....	
74,685	13,000	.0054	....	
80,430	14,000	.0060	....	
86,175	15,000	.0065	.0054	
91,920	16,000	.0074	....	
97,665	17,000	.0084	....	
103,410	18,000	.0094	....	
109,155	19,000	.0104	....	
114,900	20,000	.0119	.0094	
120,645	21,000	.0134	....	
126,390	22,000	.0146	....	
132,135	23,000	.0164	....	
137,880	24,000	.0189	....	
143,625	25,000	.0224	.0166	
149,370	26,000	.0295	....	
155,115	27,000	.0403	....	
160,860	28,000	.0553	....	**Edges contract.**
166,605	29,000	.0690	....	
172,350	30,000	.0851	.0752	
178,095	31,000	.0980	....	**Scale starts.**
183,840	32,000	.115	....	
189,585	33,000	.15	....	
195,330	34,000	.18	....	
201,075	35,000	.21	....	
206,820	36,000	.23	....	
212,565	37,000	.27	....	
218,310	38,000	.31	....	
224,055	39,000	.37	....	
229,800	40,000	.42	....	
233,000	40,560	.50	....	Tensile strength.
160,000	....	....	....	**Test discontinued while sustaining this load, before the fracture of plate was completed.**

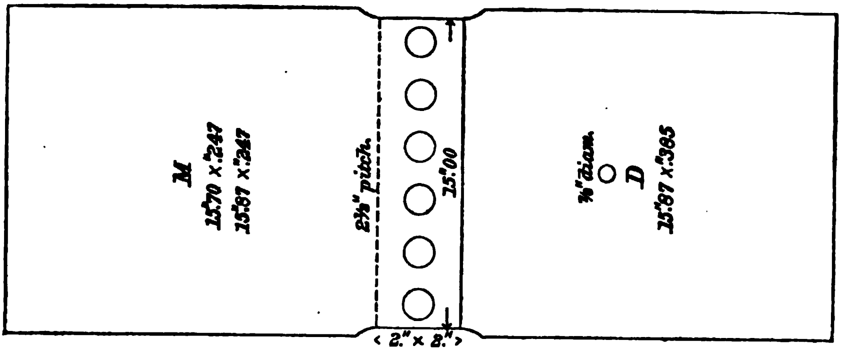
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40,560
Tension on net section of plate	62,400
Compression on bearing surface of rivets	115,860
Shearing on rivets	32,290

The plate began to fracture at one edge and had extended through three sections when the test was discontinued. Appearance silky, lamellar.

No. 1379.

(⅜" steel plate.)



(1 3/16 iron rivets; ⅞ drilled holes; 2½ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.775
Net sectional area of plate	3.754
Bearing surface of rivets	2.021
Shearing area of rivets	7.216

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,775	1,000	0.	0.	Initial load.
11,550	2,000	.0001	....	
17,325	3,000	.0002	....	
23,100	4,000	.0004	....	
28,875	5,000	.0008	.0001	
34,650	6,000	.0010	....	
40,425	7,000	.0015	....	
46,200	8,000	.0028	....	
51,975	9,000	.0038	....	
57,750	10,000	.0043	.0026	
63,525	11,000	.0048	....	
69,300	12,000	.0057	....	
75,075	13,000	.0068	....	
80,850	14,000	.0078	....	
86,625	15,000	.0093	.0066	
92,400	16,000	.0113	....	
98,175	17,000	.0123	....	
103,950	18,000	.0133	....	
109,725	19,000	.0144	....	
115,500	20,000	.0155	.0112	
121,275	21,000	.0173	....	
127,050	22,000	.0187	....	
132,825	23,000	.0210	....	
138,600	24,000	.0258	....	
144,375	25,000	.0317	.0237	
150,150	26,000	.0427	....	
155,925	27,000	.0570	....	Edges contract.
161,700	28,000	.0740	....	
167,475	29,000	.0945	....	Scale starts.
173,250	30,000	.1120	.1012	
179,025	31,000	.15	....	
184,800	32,000	.17	....	
190,575	33,000	.19	....	
196,350	34,000	.21	....	
202,125	35,000	.25	....	
207,900	36,000	.29	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
218,675	37,000	.33	....	
219,450	38,000	.38	....	
225,225	39,000	.42	....	
231,000	40,000	.49	....	
235,060	40,700	.60	....	Tensile strength.

Test discontinued soon after passing the maximum load.

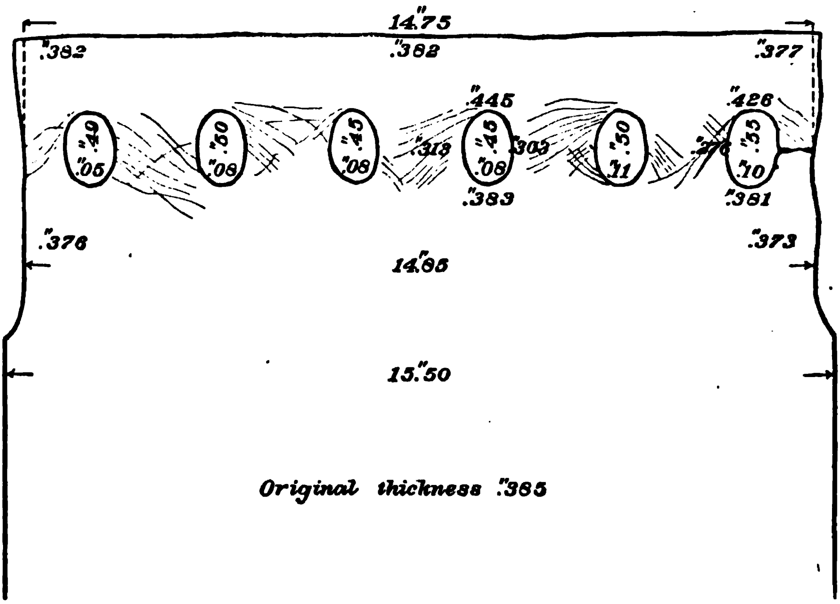
Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40,700
Tension on net section of plate	62,620
Compression on bearing surface of rivets	116,280
Shearing on rivets	32,570

Elongation of rivet holes in plate, ".49, ".50, ".45, "4.5, ".50, ".55.
Widths (maximum) of rivet holes, ".93, ".96, ".96, ".96, ".99, ".98.

No. 1379.

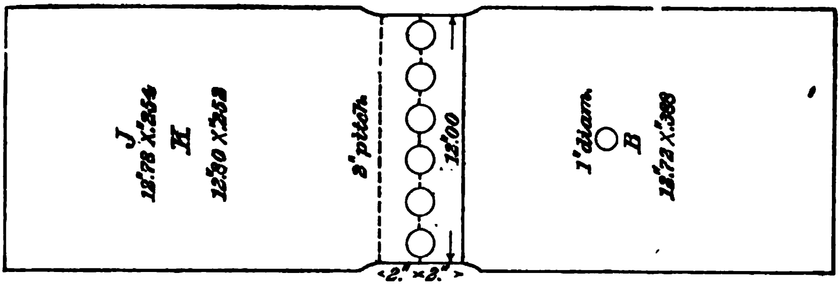
(⅜" steel plate.)



Sketch of the plate after testing, showing widths and thicknesses, the elongations of rivet holes, and the positions of curved lines formed, in relief, about the rivet holes.

No. 1380.

($\frac{3}{8}$" steel plate.)



($\frac{15}{16}$ iron rivets; 1" drilled holes; 2" pitch.)

Areas.	Square inches
Gross sectional area of plate	4.656
Net sectional area of plate	2.328
Bearing surface of rivets	2.328
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,656	1,000	0.	0.	Initial load.
9,312	2,000	.0001	....	
13,968	3,000	.0001	....	
18,624	4,000	.0002	....	
23,280	5,000	.0004	.0002	
27,936	6,000	.0010	....	
32,592	7,000	.0020	....	
37,248	8,000	.0032	....	
41,904	9,000	.0046	....	
46,560	10,000	.0055	.0049	
51,216	11,000	.0065	....	
55,872	12,000	.0072	....	
60,528	13,000	.0079	....	
65,184	14,000	.0085	....	
69,840	15,000	.0092	.0070	
74,496	16,000	.0102	....	
79,152	17,000	.0111	....	
83,808	18,000	.0121	....	
88,464	19,000	.0132	....	
93,120	20,000	.0146	.0110	
97,776	21,000	.0166	....	
102,432	22,000	.0183	....	
107,088	23,000	.0208	....	
111,744	24,000	.0244	....	
116,400	25,000	.0285	.0223	
121,056	26,000	.0365	....	Edges contract.
125,712	27,000	.0448	....	
130,368	28,000	.0550	....	
135,024	29,000	.0660	....	
139,680	30,000	.0787	.0695	
144,336	31,000	.0954	....	
148,992	32,000	.111	....	
153,648	33,000	.14	....	Scale starts.
158,304	34,000	.19	....	
160,650	34,500	.25	....	Tensile strength.

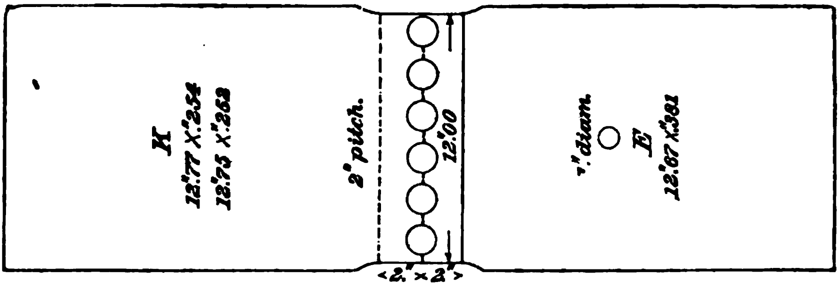
Simultaneous fracture of plate along line of riveting. Appearance silky, slight lamination.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	34,500
Tension on net section of plate	69,010
Compression on bearing surface of rivets	69,010
Shearing on rivets	17,050

Elongation of rivet holes, ".40, ".40, ".41, ".40, ".39, ".39.
Not open at edges.

No. 1381.

($\frac{3}{8}''$ steel plate.)



($\frac{15}{16}''$ iron rivets; 1″ drilled holes; 2″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.572
Net sectional area of plate	2.286
Bearing surface of rivets	2.286
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,572	1,000	0.	0.	Initial load.
9,144	2,000	.0001		
13,716	3,000	.0002		
18,288	4,000	.0004		
22,860	5,000	.0008	.0003	
27,432	6,000	.0014		
32,004	7,000	.0028		
36,576	8,000	.0038		
41,148	9,000	.0045		
45,720	10,000	.0060	.0047	
50,292	11,000	.0070		
54,864	12,000	.0074		
59,436	13,000	.0082		
64,008	14,000	.0093		
68,580	15,000	.0100	.0075	
73,152	16,000	.0110		
77,724	17,000	.0121		
82,296	18,000	.0129		
86,868	19,000	.0142		
91,440	20,000	.0155	.0115	
96,012	21,000	.0170		
100,584	22,000	.0185		
105,156	23,000	.0220		
109,728	24,000	.0260		
114,300	25,000	.0310	.0250	
118,872	26,000	.0360		
123,444	27,000	.0470		
128,016	28,000	.0650		Edges contract.
132,588	29,000	.0780		
137,160	30,000	.0895		
141,732	31,000	.110		
146,304	32,000	.14		
150,876	33,000	.17		
152,900	33,440	.26		Tensile strength.

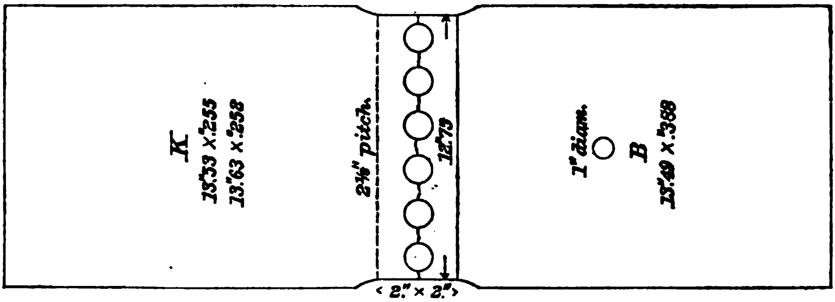
Fractured along line of riveting. Appearance silky, slightly lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	33,440
Tension on net section of plate	66,880
Compression on bearing	66,880
Shearing on rivets	16,220

Elongation of rivet holes, ″.38, ″.37, ″.38, ″.38, ″.37, ″.36.
Not open at edges.

No. 1382.

($\frac{3}{8}$" steel plate.)



($\frac{15}{16}$" iron rivets; 1" drilled holes; 2⅛" pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.947
Net sectional area of plate	2.619
Bearing surface of rivets	2.328
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,947	1,000	0.	0.	Initial load.
9,894	2,000	.0001		
14,841	3,000	.0002		
19,788	4,000	.0004		
24,735	5,000	.0008	.0001	
29,682	6,000	.0020		
34,629	7,000	.0036	.0027	
39,576	8,000	.0049		
44,523	9,000	.0065		
49,470	10,000	.0080	.0065	
54,417	11,000	.0090		
59,364	12,000	.0100		
64,311	13,000	.0105		
69,258	14,000	.0110		
74,205	15,000	.0115	.0090	
79,152	16,000	.0125		
84,099	17,000	.0135		
89,046	18,000	.0145		
93,993	19,000	.0155		
98,940	20,000	.0165	.0124	
103,887	21,000	.0180		
108,834	22,000	.0200		
113,781	23,000	.0210		
118,728	24,000	.0230		
123,675	25,000	.0265	.0205	
128,622	26,000	.0325		
133,569	27,000	.0398		Edges contract.
138,516	28,000	.0477		
143,463	29,000	.0585		
148,410	30,000	.0685	.0593	
153,357	31,000	.0860		Scale starts off plate.
158,304	32,000	.102		Scale starts off covers.
163,251	33,000	.12		
168,198	34,000	.17		
173,145	35,000	.22		
176,080	35,590	.31		Tensile strength.

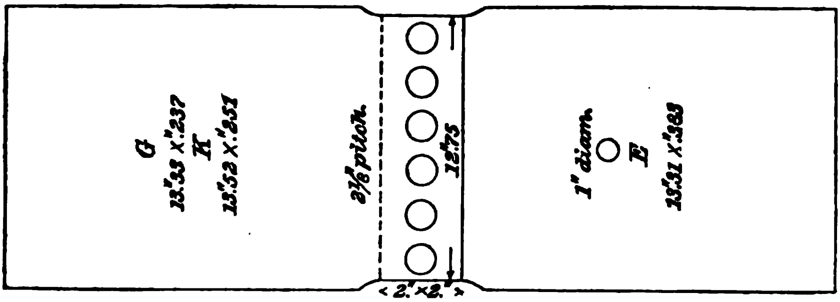
Fractured the plate along the line of riveting, beginning at the east edge. Appearance silky, slightly lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	35,590
Tension on net section of plate	67,230
Compression on bearing surface of rivets	75,640
Shearing on rivets	18,680

Elongation of rivet holes, ".43, ".42, ".41, ".40, ".38, ".40.
Open at edges ".03 each.

No. 1383.

($\frac{3}{8}''$ steel plate.)



($\frac{15}{16}$ iron rivets; 1″ drilled holes; 2⅛″ pitch.)

Areas.

	Square inches.
Gross sectional area of plate	4. 883
Net sectional area of plate	2. 585
Bearing surface of rivets	2. 298
Shearing area of rivets	9. 425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4, 883	1, 000	0.	0.	Initial load.
9, 766	2, 000	.0001	....	
14, 649	3, 000	.0002	....	
19, 532	4, 000	.0003	....	
24, 415	5, 000	.0005	.0001	
29, 298	6, 000	.0014	....	
34, 181	7, 000	.0026	....	
39, 064	8, 000	.0038	....	
43, 947	9, 000	.0053	....	
48, 830	10, 000	.0067	.0052	
53, 713	11, 000	.0075	....	
58, 596	12, 000	.0085	....	
63, 479	13, 000	.0095	....	
68, 362	14, 000	.0102	....	
73, 245	15, 000	.0110	.0083	
78, 128	16, 000	.0118	....	
83, 011	17, 000	.0126	....	
87, 894	18, 000	.0135	....	
92, 777	19. 000	.0151	....	
97, 660	20, 000	.0166	.0121	
102, 543	21, 000	.0186	....	
107, 426	22, 000	.0205	....	
112, 309	23, 000	.0235	....	
117, 192	24, 000	.0264	....	
122, 075	25, 000	.0301	.0236	
126, 958	26, 000	.0393	....	Edges contract.
131, 841	27, 000	.0485	....	
136, 724	28, 000	.0595	....	
141, 607	29, 000	.0720	....	
146, 490	30, 000	.0866	....	
151, 373	31, 000	.1060	....	
169, 600	34, 730	....	....	Tensile strength.
160, 000	....	....	....	Test discontinued.

Maximum stress on joint.

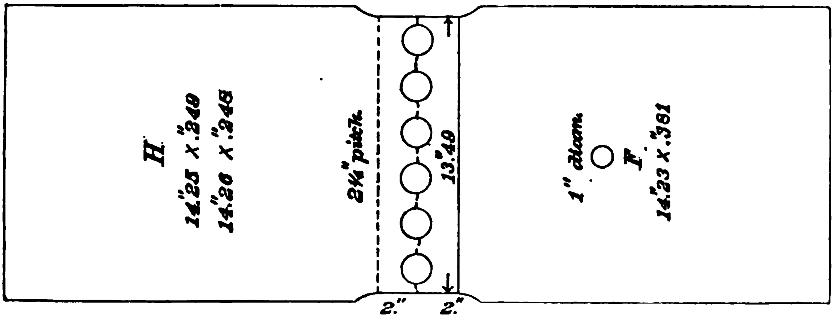
	Pounds per square inch.
Tension on gross section of plate	34, 730
Tension on net section of plate	65, 610
Compression on bearing surface of rivets	73, 800
Shearing on rivets	17, 990

Elongation of rivet holes, ″.32, ″.32, ″.32, ″.32, ″.32, ″.32.

Width of rivet holes, 1″.07, 1″.11, 1″.11, 1″.12, 1″.12, 1″.06.

No. 1384.

(⅜″ steel plate.)



(1 5/16″ iron rivets; 1″ drilled holes; 2¼″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.140
Net sectional area of plate	2.854
Bearing surface of rivets	2.286
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,140	1,000	0.	0.	Initial load.
10,280	2,000	.0002	....	
15,420	3,000	.0005	....	
20,560	4,000	.0008	....	
25,700	5,000	.0017	.0003	
30,840	6,000	.0028	....	
35,980	7,000	.0053	....	
41,120	8,000	.0070	....	
46,260	9,000	.0087	....	
51,400	10,000	.0097	.0003	
56,540	11,000	.0107	....	
61,680	12,000	.0115	....	
66,820	13,000	.0122	....	
71,960	14,000	.0129	....	
77,100	15,000	.0137	.0087	
82,240	16,000	.0150	....	
87,380	17,000	.0160	....	
92,520	18,000	.0170	....	
97,660	19,000	.0187	....	
102,800	20,000	.0207	.0137	
107,940	21,000	.0232	....	
113,080	22,000	.0253	....	
118,220	23,000	.0283	....	
123,360	24,000	.0322	....	
128,500	25,000	.0373	.0279	
133,640	26,000	.0433	....	
138,780	27,000	.0525	....	Edges contract.
143,920	28,000	.0670	....	
149,060	29,000	.0757	....	
154,200	30,000	.0930	....	
159,340	31,000	.11	....	Scale starts.
164,480	32,000	.14	....	
169,620	33,000	.17	....	
174,760	34,000	.21	....	
179,900	35,000	.25	....	
182,450	35,490	.31	....	Tensile strength.

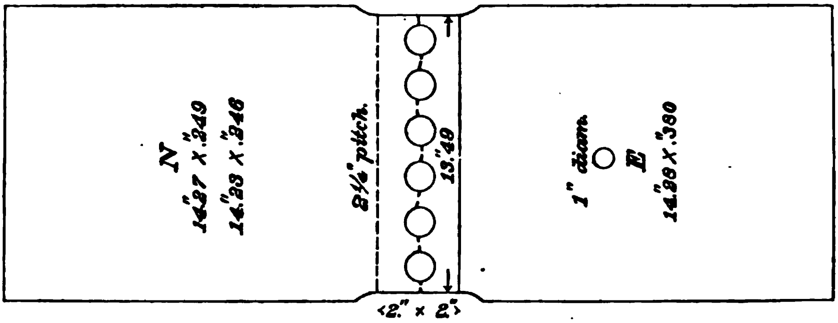
Fractured the plate along line of riveting, beginning at the west edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	35,490
Tension on net section of plate	63,930
Compression on bearing surface of rivets	79,810
Shearing on rivets	19,360

Elongation of rivet holes, ″.52, ″.48, ″.46, ″.44, ″.44, ″46.
Open at edges ″.15 and ″.04.

No. 1385.

(⅜" steel plate.)



($\frac{15}{16}$" iron rivets; 1" drilled holes; 2¼" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.126
Net sectional area of plate	2.846
Bearing surface of rivets	2.280
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,126	1,000	0.	0.	Initial load.
10,252	2,000	.0001	....	
15,378	3,000	.0003	....	
20,504	4,000	.0007	....	
25,630	5,000	.0012	.0007	
30,756	6,000	.0026	....	
35,882	7,000	.0035	....	
41,008	8,000	.0045	....	
46,134	9,000	.0055	....	
51,260	10,000	.0066	.0052	
56,386	11,000	.0080	....	
61,512	12,000	.0087	....	
66,638	13,000	.0097	....	
71,764	14,000	.0107	....	
76,890	15,000	.0114	.0085	
82,016	16,000	.0122	....	
87,142	17,000	.0132	....	
92,268	18,000	.0139	....	
97,394	19,000	.0152	....	
102,520	20,000	.0164	.0120	
107,646	21,000	.0187	....	
112,772	22,000	.0202	....	
117,898	23,000	.0218	....	
123,024	24,000	.0256	....	
128,150	25,000	.0281	.0212	
133,276	26,000	.0347	....	
138,402	27,000	.0435	....	Edges contract.
143,528	28,000	.0565	....	
148,654	29,000	.0687	....	
153,780	30,000	.0821	....	
158,906	31,000	.104	....	
164,032	32,000	.12	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
169,158	33,000	.15	....	
174,284	34,000	.19	....	
179,410	35,000	.24	....	Scale starts.
183,700	35,840	.31	....	Tensile strength.

Fractured plate along line of riveting, beginning at the east edge. Appearance silky, very lamellar.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	35,840
Tension on net section of plate	64,550
Compression on bearing surface of rivets	80,570
Shearing on rivets	19,490

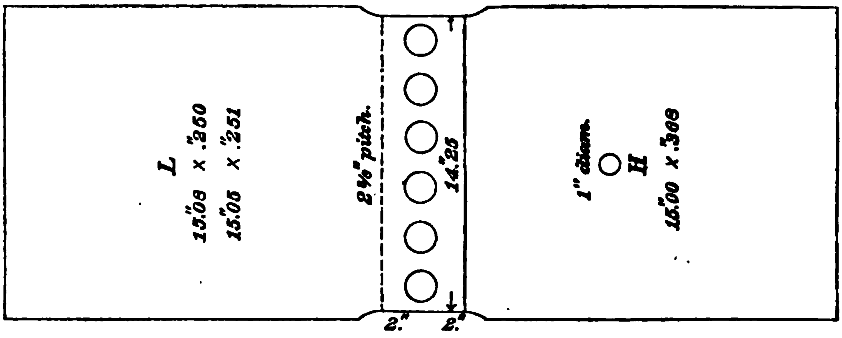
Elongation of rivet holes, ''.53, ''.50, ''.48, ''.45, ''.45, ''.46.
Open at edges ''.7 and ''.2.

Fractured areas.

	Square inches
0.42 ×.24=	.1008
1.08 ×.22=	.2376
1.04 ×.21=	.2184
1.06 ×.20=	.2120
1.04 ×.20=	.2080
1.08 ×.21=	.2268
0.43 ×.24=	.1032
	1,3068; Contraction, 54.1 per cent.

No. 1386.

($\frac{3}{8}$'' steel plate.)



($\frac{15}{16}$'' iron rivets; 1'' drilled holes; 2$\frac{3}{8}$'' pitch.)

Areas.	Square inches.
Gross sectional area of plate	5. 244
Net sectional area of plate	3. 036
Bearing surface of rivets	2. 208
Shearing area of rivets	9. 425

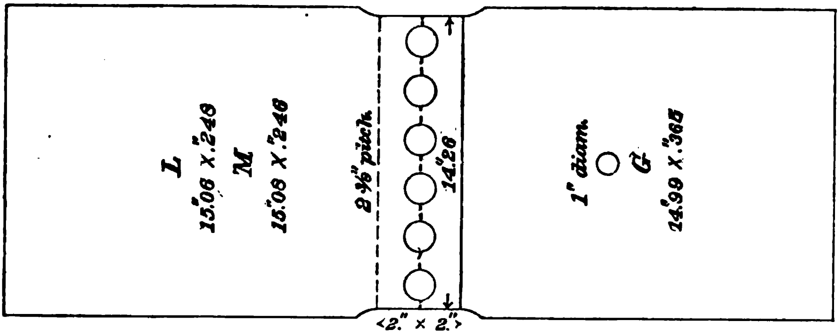
Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5, 244	1, 000	0.	0.	Initial load.
10, 488	2, 000	—. 0002		
15, 732	3, 000	—. 0002		
20, 976	4, 000	—. 0001		
26, 220	5, 000	0.	. 0001	
31, 464	6, 000	. 0002		
36, 708	7, 000	. 0018		
41, 952	8, 000	. 0028		
47, 196	9, 000	. 0038		
52, 440	10, 000	. 0051	. 0061	
57, 684	11, 000	. 0071		
62, 928	12, 000	. 0076		
68, 172	13, 000	. 0080		
73, 416	14, 000	. 0086		
78, 660	15, 000	. 0093	. 0098	
83, 904	16, 000	. 0103		
89, 148	17, 000	. 0113		
94, 392	18, 000	. 0123		
99, 636	19, 000	0133		
104, 880	20, 000	. 0148	. 0138	
110, 124	21, 000	. 0159		
115, 368	22, 000	. 0169		
120, 612	23, 000	. 0183		
125, 856	24, 000	. 0199		
131, 100	25, 000	. 0231	. 0198	
136, 344	26, 000	. 0293		
141, 588	27, 000	. 0364		Edges contract.
146, 832	28, 000	. 0490		
152, 076	29, 000	. 0635		
157, 320	30, 000	. 0806	. 0730	
162, 564	31, 000	. 1040		Scale starts.
167, 808	32, 000	. 13		
173, 052	33, 000	. 16		
178, 296	34, 000	. 19		
183, 540	35, 000	. 22		
188, 784	36, 000	. 27		
194, 028	37, 000	. 37		
194, 100	37, 010	. 39		Tensile strength.
190, 000				Test discontinued.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37, 010
Tension on net section of plate	63, 930
Compression on bearing surface of rivets	87, 910
Shearing on rivets	20, 590

Elongation of rivet holes, ''.41, ''.37, ''.36, ''.34, ''.35, ''.38.
Width of rivet holes, 1''.09, 1''.10, 1''.11, 1''.10, 1''.10, 1''.06.

No. 1387.

($\frac{3}{8}''$ steel plate.)



($\frac{15}{16}$ iron rivets; 1'' drilled holes; $2\frac{3}{8}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.205
Net sectional area of plate	3.015
Bearing surface of rivets	2.190
Shearing area of rivets	9.425

Applied load.		In gauged length.		Remarks.
Total	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,205	1,000	0.	0.	Initial load.
10,410	2,000	.0001	....	
15,615	3,000	.0002	....	
20,820	4,000	.0003	....	
26,025	5,000	.0004	.0002	
31,230	6,000	.0005	....	
36,435	7,000	.0010	....	
41,640	8,000	.0020	....	
46,845	9,000	.0025	....	
52,050	10,000	.0032	.0023	
57,255	11,000	.0037	....	
62,460	12,000	.0043	....	
67,665	13,000	.0050	....	
72,870	14,000	.0058	....	
78,075	15,000	.0068	.0043	
83,280	16,000	.0083	....	
88,485	17,000	.0098	....	
93,690	18,000	.0117	....	
98,895	19,000	.0132	....	
104,100	20,000	.0147	.0107	
109,305	21,000	.0172	....	
114,510	22,000	.0202	....	
119,715	23,000	.0238	....	
124,920	24,000	.0282	....	Edges contract.
130,125	25,000	.0337	.0277	
135,330	26,000	.0408	....	
140,535	27,000	.0462	....	
145,740	28,000	.0549	....	
150,945	29,000	.0690	....	
156,150	30,000	.0790	....	Scale starts.
161,355	31,000	.0930	....	
166,560	32,000	.1180	....	
171,765	33,000	.15	....	
176,970	34,000	.18	....	
182,175	35,000	.21	....	
187,380	36,000	.29	....	
191,300	36,750	.37	....	Tensile strength.

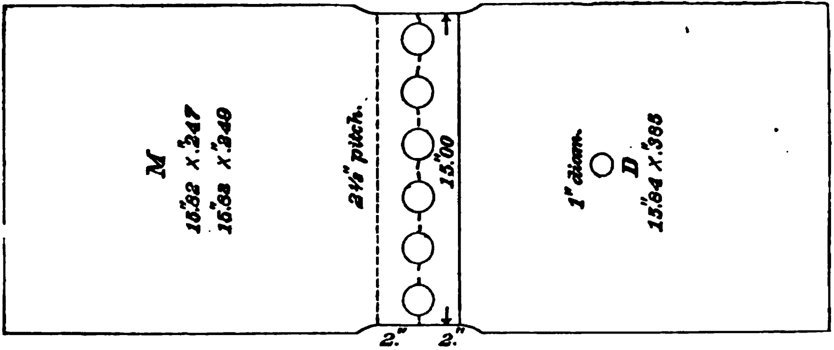
Simultaneous fracture of plate along line of riveting. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	36,750
Tension on net section of plate	63,450
Compression on bearing surface of rivets	87,350
Shearing on rivets	20,300

Elongation of rivet holes, ''.50, ''.52, ''.48, ''.48, ''.48, ''.50.
Open at edges ''.05 each.

No. 1388.

($\frac{3}{8}''$ steel plate.)



($\frac{15}{16}''$ iron rivets; 1″ drilled holes; $2\frac{1}{2}''$ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.775
Net sectional area of plate	3.465
Bearing surface of rivets	2.310
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,775	1,000	0.	0.	Initial load.
11,550	2,000	.0001	....	
17,325	3,000	.0002	....	
23,100	4,000	.0004	....	
28,875	5,000	.0005	.0002	
34,650	6,000	.0010	....	
40,425	7,000	.0017	....	
46,200	8,000	.0032	....	
51,975	9,000	.0047	....	
57,750	10,000	.0057	.0047	
63,525	11,000	.0067	....	
69,300	12,000	.0080	....	
75,075	13,000	.0087	....	
80,850	14,000	.0097	....	
86,625	15,000	.0104	.0076	
92,400	16,000	.0112	....	
98,175	17,000	.0121	....	
103,950	18,000	.0131	....	
109,725	19,000	.0147	....	
115,500	20,000	.0162	.0119	
121,275	21,000	.0181	....	
127,050	22,000	.0195	....	
132,825	23,000	.0212	....	
138,600	24,000	.0236	....	
144,375	25,000	.0281	.0217	Edges contract.
150,150	26,000	.0368	....	Scale starts.
155,925	27,000	.0475	....	
161,700	28,000	.0587	....	
167,475	29,000	.0721	....	
173,250	30,000	.0930	....	
179,025	31,000	.1180	....	
184,800	32,000	.16	....	
190,575	33,000	.18	....	
196,350	34,000	.20	....	
202,125	35,000	.22	....	
207,900	36,000	.28	....	
213,675	37,000	.33	....	
216,480	37,490	.42	....	Tensile strength.

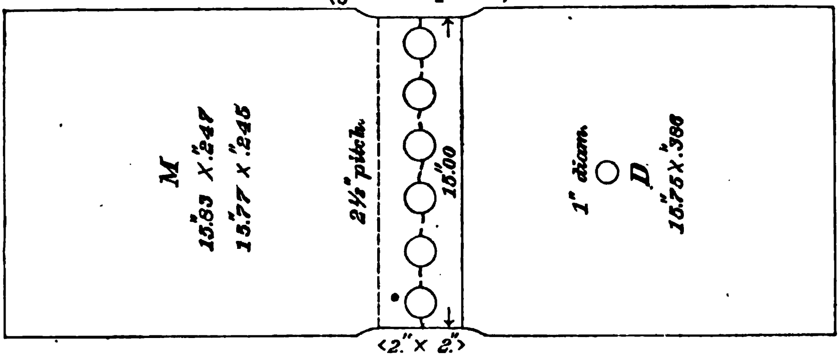
Fractured plate along line of riveting, beginning at the west edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37,490
Tension on net section of plate	62,480
Compression on bearing surface of rivets	93,710
Shearing on rivets	22,970

Elongation of rivet holes, ″.54, ″.53, ″.52, ″56, ″.60, ″.69.
Open at edges, ″.10 and ″.25.

No. 1389.

($\frac{3}{8}''$ steel plate.)



($\frac{15}{16}''$ iron rivets; 1″ drilled holes; 2½ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.790
Net sectional area of plate	3.474
Bearing surface of rivets	2.316
Shearing area of rivets	9.425

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,790	1,000	0.	0.	Initial load.
11,580	2,000	.0001	....	
17,370	3,000	.0002	....	
23,160	4,000	.0003	....	
28,950	5,000	.0004	.0001	
34,740	6,000	.0005	....	
40,530	7,000	.0011	....	
46,320	8,000	.0023	....	
52,110	9,000	.0036	....	
57,900	10,000	.0047	.0037	
63,690	11,000	.0051	....	
69,480	12,000	.0064	....	
75,270	13,000	.0075	....	
81,060	14,000	.0085	....	
86,850	15,000	.0095	.0074	
92,640	16,000	.0105	....	
98,430	17,000	.0115	....	
104,220	18,000	.0125	....	
110,010	19,000	.0135	....	
115,800	20,000	.0151	.0116	
121,590	21,000	.0171	....	
127,380	22,000	.0186	....	
133,170	23,000	.0207	....	
138,960	24,000	.0251	....	
144,750	25,000	.0296	.0236	Edges contract.
150,540	26,000	.0386	....	
156,330	27,000	.0485	....	
162,120	28,000	.0605	....	
167,910	29,000	.0760	....	
173,700	30,000	.0925	....	
179,490	31,000	.12	....	Scale starts.
185,280	32,000	.15	....	
191,070	33,000	.17	....	
196,860	34,000	.20	....	
202,650	35,000	.23	....	
208,440	36,000	.28	....	
214,230	37,000	.35	....	
216,300	37,360	.41	....	Tensile strength.

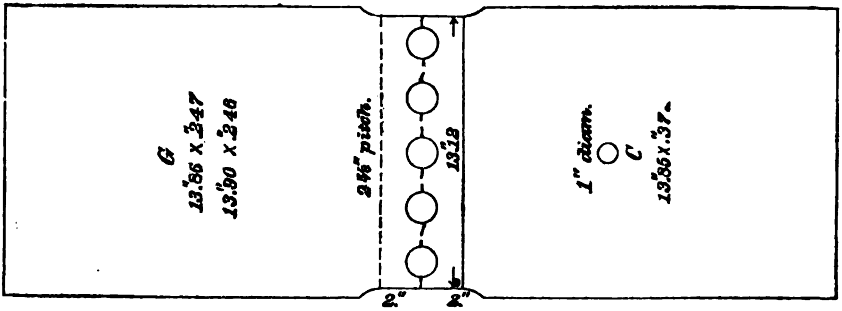
Fractured plate along line of riveting, beginning at the east edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	37,360
Tension on net section of plate	62,260
Compression on bearing surface of rivets	93,390
Shearing on rivets	21,890

Elongation of rivet holes, ″.62, ″.57, ″.56, ″.51, ″.55, ″.59.
Open at edges, ″.07 and ″.15.

No. 1390.

(⅜″ steel plate.)



(1 5/16″ iron rivets; 1″ drilled holes; 2⅝ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.881
Net sectional area of plate	3.021
Bearing surface of rivets	1.860
Shearing area of rivets	7 854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,881	1,000	.0	.0	Initial load.
9,762	2,000	.0001	....	
14,643	3,000	.0001	....	
19,524	4,000	.0003	....	
24,405	5,000	.0003	.0004	
29,286	6,000	.0008	....	
34,167	7,000	.0026	....	
39,048	8,000	.0042	....	
43,929	9,000	.0048	....	
48,810	10,000	.0057	.0054	
53,691	11,000	.0062	....	
58,572	12,000	.0071	....	
63,453	13,000	.0081	....	
68,334	14,000	.0089	....	
73,215	15,000	.0101	.0090	
78,096	16,000	.0117	....	
82,977	17,000	.0127	....	
87,858	18,000	.0139	....	
92,739	19,000	.0149	....	
97,620	20,000	.0161	.0141	
102,501	21,000	.0181	....	
107,382	22,000	.0189	....	
112,263	23,000	.0200	....	
117,144	24,000	.0217	....	
122,025	25,000	.0253	.0213	
126,906	26,000	.0325	....	Edges contract.
131,787	27,000	.0405	....	
136,668	28,000	.0528	....	
141,549	29,000	.0755	....	
146,430	30,000	.0940	....	Scale starts.
151,311	31,000	.116	....	
156,192	32,000	.14	....	
161,073	33,000	.18	....	
165,954	34,000	.21	....	
170,835	35,000	.23	....	
175,716	36,000	.28	....	
180,597	37,000	.32	....	
185,478	38,000	.38	....	
190,100	38,950	.50	....	
190,359	39,000	.55	....	Tensile strength.

Simultaneous fracture of plate along line of riveting. Appearance silky, slight lamination.

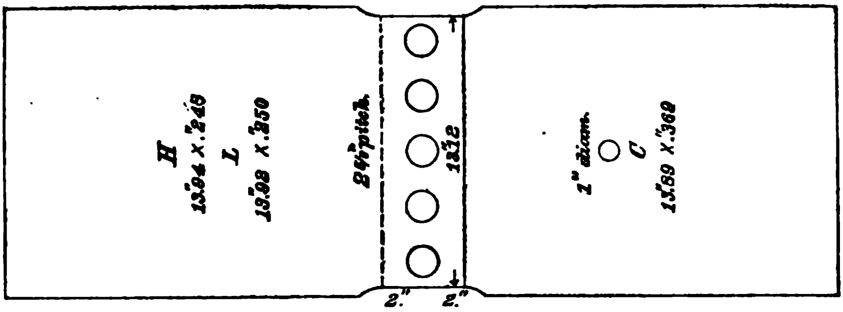
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,000
Tension on net section of plate	63,010
Compression on bearing surface of rivets	102,340
Shearing on rivets	24,240

Elongation of rivet holes, ″.63, ″.61, ″.58, ″.61, ″.65.

Open at edges, ″.10 and ″.05.

No. 1391.

(⅜" steel plate.)



(1 5/16" iron rivets; 1" drilled holes; 2⅝ pitch.)

Areas.	Square inches.
Gross sectional area of plate	4.841
Net sectional area of plate	2.996
Bearing surface of rivets	1.845
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
4,841	1,000	.0	.0	Initial load.
9,682	2,000	.0001		
14,523	3,000	.0003		
19,364	4,000	.0004		
24,205	5,000	.0006	.001	
29,046	6,000	.0016		
33,887	7,000	.0037		
38,728	8,000	.0054		
43,569	9,000	.0069		
48,410	10,000	.0079	.0065	
53,251	11,000	.0089		
58,092	12,000	.0097		
62,933	13,000	.0107		
67,774	14,000	.0116		
72,615	15,000	.0125	.0100	
77,456	16,000	.0140		
82,297	17,000	.0153		
87,138	18,000	.0165		
91,979	19,000	.0176		
96,820	20,000	.0188	.0147	
101,661	21,000	.0203		
106,502	22,000	.0214		
111,343	23,000	.0228		
116,184	24,000	.0250		Edges contract.
121,025	25,000	.0286	.0225	
125,866	26,000	.0371		
130,707	27,000	.0469		
135,548	28,000	.0625		
140,389	29,000	.0790		Scale starts.
145,230	30,000	.0925		
150,071	31,000	.119		
154,912	32,000	.13		
159,753	33,000	.17		
164,594	34,000	.20		
169,435	35,000	.23		
174,276	36,000	.26		
179,117	37,000	.31		
183,958	38,000	.36		
188,799	39,000	.43		
191,300	39,520	.52		Tensile strength.

Test discontinued before fracture was completed.

Joint failed along line of riveting in plate.

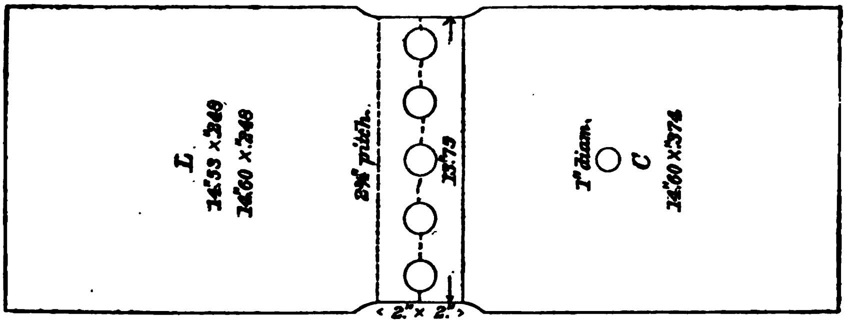
Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,520
Tension on net section of plate	63,850
Compression on bearing surface of rivets	103,690
Shearing on rivets	24,360

Elongation of rivet holes, ".53*, ".48, ".47, ".48, ".52*. End sections began to fracture.

Width of rivet holes, 1".11, 1".14, 1".12, 1".14, 1".10.

No. 1392.

(⅜" steel plate.)



(1 5/16 iron rivets; 1" drilled holes; 2¼" pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.143
Net sectional area of plate	3.273
Bearing surface of rivets	1.870
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,143	1,000	.0	.0	Initial load.
10,286	2,000	.0001	....	
15,429	3,000	.0002	....	
20,572	4,000	.0004	....	
25,715	5,000	.0009	.0004	
30,858	6,000	.0030	....	
36,001	7,000	.0040	....	
41,144	8,000	.0049	....	
46,287	9,000	.0059	....	
51,430	10,000	.0079	.0064	
56,573	11,000	.0097	....	
61,716	12,000	.0110	....	
66,859	13,000	.0115	....	
72,002	14,000	.0124	....	
77,145	15,000	.0133	.0103	
82,288	16,000	.0145	....	
87,431	17,000	.0155	....	
92,574	18,000	.0169	....	
97,717	19,000	.0181	....	
102,860	20,000	.0194	.0145	
108,003	21,000	.0210	....	
113,146	22,000	.0225	....	
118,289	23,000	.0241	....	
123,432	24,000	.0270	....	Edges contract.
128,575	25,000	.0370	.0251	
133,718	26,000	.0460	....	
138,861	27,000	.0670	....	
144,004	28,000	.0890	....	
149,147	29,000	.1040	....	Scale starts.
154,290	30,000	.13	....	
159,433	31,000	.15	....	
164,576	32,000	.18	....	
169,719	33,000	.20	....	
174,862	34,000	.22	....	
180,005	35,000	.27	....	
185,148	36,000	.31	....	
190,291	37,000	.37	....	
195,434	38,000	.41	....	
200,577	39,000	.50	....	
204,850	39,840	.61	....	Tensile strength.

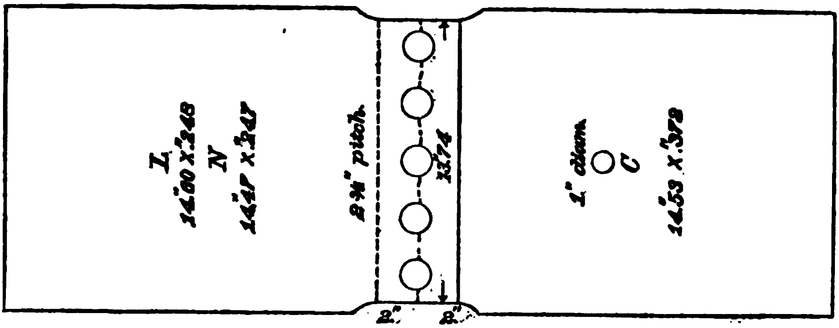
Fractured the plate along line of riveting, beginning at the east edge. Appearance silky, lamellar.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39,840
Tension on net section of plate	62,590
Compression on bearing surface of rivets	109,540
Shearing on rivet	26,080

Elongation of rivet holes, ".83, ".76, ".70, ".72, ".75.
Open at edges, ".20 and ".25.

No. 1393.

(⅜" steel plate.)



(1⅛" iron rivets; 1" drilled holes; 2¾" pitch.)

Areas.

	Square inches.
Gross sectional area of plate	5.111
Net sectional area of plate	3.251
Bearing surface of rivets	1.860
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,111	1,000	0.	0.	Initial load.
10,222	2,000	.0000	....	
15,333	3,000	.0001	....	
20,444	2,000	.0002	....	
25,555	5,000	.0003	.0002	
30,666	6,000	.0022	.0021	
35,777	7,000	.0042	....	
40,888	8,000	.0055	....	
45,999	9,000	.0065	....	
51,110	10,000	.0075	.0065	
56,221	11,000	.0085	....	
61,332	12,000	.0094	....	
66,443	13,000	.0102	....	
71,554	14,000	.0118	....	
71,665	15,000	.0125	.0105	
81,776	16,000	.0145	....	
86,887	17,000	.0159	....	
91,998	18,000	.0171	....	
97,109	19,000	.0185	....	
102,220	20,000	.0199	.0159	
107,331	21,000	.0216	....	
112,442	22,000	.0227	....	
117,553	23,000	.0242	....	
122,664	24,000	.0262	....	Edges contract.
127,775	25,000	.0291	.0231	
132,886	26,000	.0384	....	
137,997	27,000	.0555	....	
143,108	28,000	.0733	....	
148,219	29,000	.0915	....	
153,330	30,000	.1090	....	
158,441	31,000	.12	....	
163,552	32,000	.15	....	
168,663	33,000	.19	....	Scale starts.
173,774	34,000	.21	....	
178,885	35,000	.23	....	
183,996	36,000	.27	....	
189,107	37,000	.32	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
194, 218	38, 000	.39	....	
199, 329	39, 000	.43	....	
204, 440	40, 000	.54	....	
206, 600	40, 420	.62	....	Tensile strength.

Fractured the plate along line of riveting, beginning at the east edge. Appearance silky, lamellar.

Maximum stress on joint.

	Pounds per square inch.
Tension on gross section of plate	40, 420
Tension on net section of plate	63, 550
Compression on bearing surface of rivets	111, 070
Shearing on rivets	26, 310

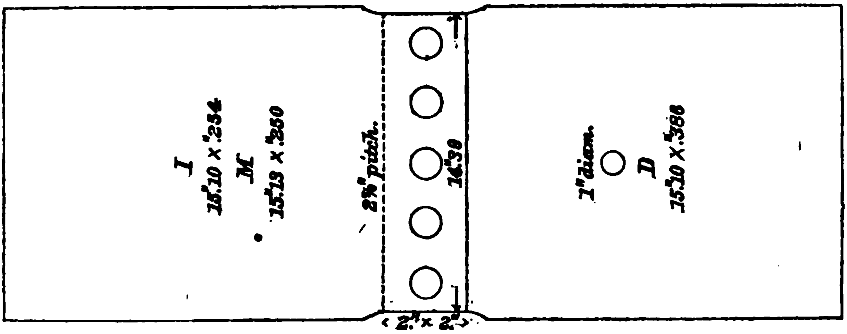
Elongation of rivet holes, ″.76, ″.71, ″.71, ″.70, ″.75.
Open at edges, ″.10 and ″.07.

Fractured areas.

	Square inch.
0″.68 × ″.25 =	.1700
1 .52 × .23 =	.3496
1 .54 × .23 =	.3542
1 .52 × .21 =	.3192
1 .53 × .21 =	.3213
0 .64 × .23 =	.1472
	1.6615; contraction, 48.9 per cent.

No. 1394.

(⅜″ steel plate.)



(1⁵⁄₁₆″ iron rivets; 1″ drilled holes; 2⅞″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.555
Net sectional area of plate	3.625
Bearing surface of rivets	1.930
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5,555	1,000	0.	0.	
11,110	2,000	.0001	....	Initial load.
16,665	3,000	.0002	....	
22,220	4,000	.0004	....	
27,775	5,000	.0009	.0004	
33,330	6,000	.0023	....	
38,885	7,000	.0034	....	
44,440	8,000	.0050	....	
49,995	9,000	.0061	....	
55,550	10,000	.0084	.0072	
61,105	11,000	.0100	....	
66,660	12,000	.0108	....	
72,215	13,000	.0115	....	
77,770	14,000	.0125	....	
83,325	15,000	.0138	.0113	
88,880	16,000	.0153	....	
94,435	17,000	.0169	....	
99,990	18,000	.0187	....	
105,545	19,000	.0202	....	
111,100	20,000	.0217	.0175	
116,655	21,000	.0240	....	
122,210	22,000	.0259	....	
127,765	23,000	.0285	....	
133,320	24,000	.0340	....	
138,875	25,000	.0487	.0410	
144,430	26,000	.0695	....	Edges contract.
149,985	27,000	.0855	....	
155,540	28,000	.1040	....	
161,095	29,000	.18	....	
166,650	30,000	.17	....	
172,205	31,000	.19	....	
177,760	32,000	.22	....	Scale starts.
183,315	33,000	.24	....	
188,870	34,000	.28	....	
194,425	35,000	.32	....	
199,980	36,000	.38	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Icnh.*	*Icnh.*	
205, 535	37, 000	.42	....	
211, 090	38, 000	.50	....	
216, 645	39, 000	.61	....	
218, 650	39, 340	.75	....	Tensile strength.

Test discontinued before fracture was completed. Plate failed along line of riveting.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate	39, 340
Tension on net section of plate	60, 290
Compression on bearing surface of rivets	113, 240
Shearing on rivets	27, 830

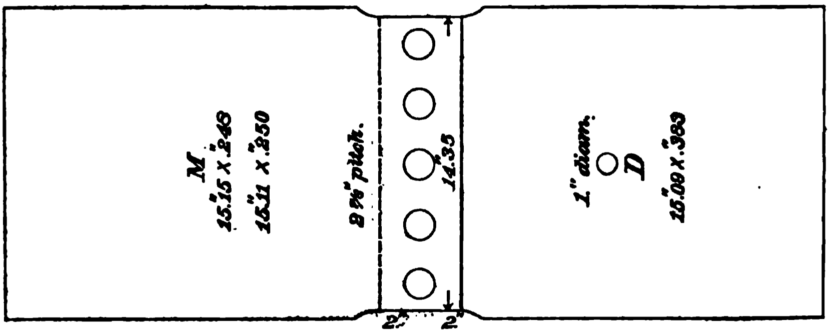
Elongation of rivet holes, ″.60, ″.61, ″.58, ″.59, ″.67*. End section fractured.

Width of rivet holes, 1″.06, 1″.12, 1″.11, 1″.12, 1″.11.

Dimensions of hole in middle of plate, length, 1″.14; width, ″.96.

No. 1395.

($\frac{3}{8}$″ steel plate.)



($\frac{15}{16}$″ iron rivets; 1″ drilled holes; 2$\frac{7}{8}$″ pitch.)

Areas.	Square inches.
Gross sectional area of plate	5.496
Net sectional area of plate	3.581
Bearing surface of rivets	1.915
Shearing area of rivets	7.854

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
5, 496	1, 000	0.	0.	Initial load.
10, 992	2, 000	.0001	....	
16, 488	3, 000	.0002	....	
21, 984	4, 000	.0005	....	
27, 480	5, 000	.0017	.0014	
32, 976	6, 000	.0037	....	
38, 472	7, 000	.0047	....	
43, 968	8, 000	.0057	....	

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
49,464	9,000	.0067	....	
54,960	10,000	.0077	.0067	
60,456	11,000	.0092	....	
65,952	12,000	.0107	....	
71,448	13,000	.0123	....	
76,944	14,000	.0132	....	
82,440	15,000	.0142	.0120	
87,936	16,000	.0153	....	
93,432	17,000	.0163	....	
98,928	18,000	.0175	....	
104,424	19,000	.0190	....	
109,920	20,000	.0209	.0168	
115,416	21,000	.0230	....	
120,912	22,000	.0259	....	Edges contract.
126,408	23,000	.0283	....	
131,904	24,000	.0309	....	
137,400	25,000	.0359	.0297	
142,896	26,000	.0537	....	
148,392	27,000	.0720	....	
153,888	28,000	.0905	....	
159,384	29,000	.109	....	Scale starts.
164,880	30,000	.13	....	
170,376	31,000	.17	....	
175,872	32,000	.20	....	
181,368	33,000	.22	....	
186,864	34,000	.25	....	
192,360	35,000	.29	....	
197,856	36,000	.32	....	
203,352	37,000	.38	....	
208,848	38,000	.44	....	
214,344	39,000	.52	....	
219,840	40,000	.62	....	
221,480	40,300	.71	....	Tensile strength.
216,000	....	....	....	Load when test was discontinued.

Plate failed along line of riveting.

Maximum stress on joint.	Pounds per square inch.
Tension on gross section of plate..................................	40,300
Tension on net section of plate..................................	61,850
Compression on bearing surface of rivets..................................	115,660
Shearing on rivets..................................	28,200

Elongation of rivet holes, ″.62, ″.57, ″.55, ″.55, ″.60.
Width of rivet holes, 1″.08, 1″.12, 1″.10, 1″.10, 1″.04.

Tabulation of O. H. steel strips representing metal employed in riveted joints.

No. of test.	Sheet letter.	Nominal thickness.	Direction of grain.	Actual dimensions.		Sectional area.	Elastic limit.		Tensile strength.		Elongation in 10 inches.	Contraction of area.	Appearance of fracture.
				Width.	Thickness.		Per square inch.	Mean.	Per square inch.	Mean.			
		Inch.		*Inches.*	*Inch.*	*Sq. in.*	*Pounds.*		*Pounds.*		*Per ct.*	*Per ct.*	
1200	A	3/16	Lengthwise.	1.497	.184	.275	42,180	43,740	63,050	63,015	16.7	51.6	Fine silky, slight lamination.
1201	B	3/16	....do	1.497	.183	.274	43,070		59,160		18.7	58.7	Silky, lamellar.
1202	C	3/16	....do	1.498	.193	.289	43,600		61,280		20.9	49.8	Do.
1203	D	3/16	....do	1.499	.186	.279	48,030		63,400		19.0	57.0	Fine silky.
1204	E	3/16	... do	1.500	.180	.270	43,700		63,370		20.0	58.1	Do.
1205	....	3/16	....do	1.502	.172	.258	41,860		67,830		25.1	50.0	Do.
1210	A	3/16	Crosswise ..	1.497	.182	.272	49,260	46,712	63,270	62,220	18.1	44.1	Silky seam.
1206	B	3/16	....do	1.498	.187	.280	43,570		61,570		15.4	32.9	Silky, lamellar.
1207	C	3/16	....do	1.495	.195	.292	47,950		61,710		22.9	35.6	Do.
1208	D	3/16	....do	1.497	.189	.283	45,940		61,130		23.2	45.9	Do.
1209	E	3/16	....do	1.407	.180	.269	46,840		63,420		22.1	47.2	Silky.
1211	F	1/4	Lengthwise.	1.493	.246	.367	38,150	40,158	61,740	60,295	24.4	48.2	Do.
1212	G	1/4	....do	1.499	.241	.361	41,550		62,660		24.3	50.4	Fine silky.
1213	H	1/4	....do	1.498	.243	.364	42,800		59,180		21.2	53.8	Silky, lamellar.
1214	I	1/4	....do	1.482	.251	.372	37,660		58,660		25.2	56.5	Fine silky.
1215	J	1/4	....do	1.499	.257	.385	38,960		61,000		25.0	58.8	Fine silky, slight lamination.
1216	K	1/4	....do	1.499	.252	.378	36,500		58,150		23.9	58.5	Silky, lamellar.
1217	L	1/4	....do	1.498	.250	.375	45,310		61,470		23.8	51.5	Do.
1218	M	1/4	....do	1.498	.244	.366	42,620		58,170		24.7	62.3	Fine silky.
1219	N	1/4	....do	1.499	.244	.366	39,340		55,740		20.4	59.8	Do.
1220	I	1/4	....do	1.498	.250	.375	38,450		62,300		22.9	48.0	Do.
1221	....	1/4	....do	1.500	.238	.357	40,340		64,170		24.2	46.2	Do.
1222	F	1/4	Crosswise ..	1.494	.248	.371	39,870	39,869	61,730	59,876	23.0	48.8	Silky, slight lamination.
1223	G	1/4	....do	1.496	.242	.362	38,680		62,870		17.0	43.6	Fine silky, surface blister.
1224	H	1/4	....do	1.481	.250	.370	45,950		60,840		21.8	47.6	Silky, slight lamination.
1225	I	1/4	....do	1.497	.252	.377	38,700		61,230		22.4	43.8	Silky, stratified.
1226	I	1/4	....do	1.475	.252	.372	37,100		60,890		25.8	47.8	Silky.
1227	J	1/4	....do	1.491	.253	.377	38,700		55,380		27.3	54.1	Fine silky.
1228	K	1/4	....do	1.498	.255	.382	36,650		53,900		24.8	51.0	Silky, lamellar.
1229	L	1/4	....do	1.492	.250	.373	38,070		57,400		19.9	49.1	Silky, slight lamination.
1230	M	1/4	....do	1 498	.246	.369	41,190		62,470		24.0	47.1	Silky, laminated, stratified.
1231	N	1/4	....do	1.498	.247	.370	43,780		62,050		22.1	43.0	Silky, laminated.
1235	O	5/16	Lengthwise.	1.498	.301	.451	33,260	36,532	54,350	57,708	30.0	60.8	Fine silky.
1236	P	5/16	....do	1.497	.304	.455	37,140		59,300		25.4	54.5	Do.
1234	Q	5/16	....do	1.499	.311	.466	33,480		56,760		24.7	56.9	Fine silky, slight lamination.
1232	R	5/16	....do	1.499	.308	.462	42,420		61,130		27.2	51.0	Fine silky.
1333	S	5/16	....do	1.499	.308	.462	36,360		57,000		26.8	58.2	Do.

1240	O	5/16	Crosswise ..	1.499	.307	.460	36,090	35,280	63,430	59,776	22.7	48.5	Silky.
1241	P	5/16	....do	1.499	.307	.460	34,350		57,280		22.1	48.9	Silky, slight lamination.
1239	Q	5/16	....do	1.500	.308	.462	34,200		57,140		24.3	50.0	Silky, lamellar.
1237	R	5/16	....do	1.497	.310	.464	36,210		60,600		21.8	48.9	Silky, slight lamination.
1238	S	5/16	...do	1.499	.312	.467	35,550		60,480		24.1	49.7	Do.
1252	A	3/8	Lengthwise.	1.498	.368	.551	33,030	33,027	54,260	56,489	25.9	57.7	Silky, lamellar.
1253	B	3/8	....do	1.498	.390	.582	34,020		59,730		26.1	52.6	Silky.
1254	C	3/8	....do	1.498	.376	.563	34,810		57,870		27.6	53.5	Silky, lamellar.
1255	D	3/8	....do	1.498	.383	.574	28,920		53,730		28.2	55.7	Silky, very lamellar.
1256	E	3/8	....do	1.498	.385	.577	33,970		58,340		27.1	55.1	Silky, slight lamination.
1257	F	3/8	....do	1.499	.378	.567	34,920		54,290		27.1	57.8	Silky, lamellar.
1258	G	3/8	....do	1.498	.365	.547	32,910		53,840		23.1	57.4	Do
1259	H	3/8	....do	1.498	.367	.550	30,550		56,670		28.5	57.6	Fine silky, slight lamination.
1260	I	3/8	....do	1.495	.372	.557	33,390		59,030		24.7	50.4	Silky, stratified.
1261	J	3/8	....do	1.496	.372	.557	33,750		57,130		26.0	56.2	Silky, slight lamination.
1242	A	3/8	Crosswise...	1.498	.368	.551	28,310	30,814	55,170	56,510	25.0	38.8	Silky, exceedingly lamellar.
1213	B	3/8	....do	1.497	.390	.584	29,110		57,850		26.6	52.9	Silky, slight lamination.
1244	C	3/8	....do	1.497	.375	.561	34,050		58,000		26.0	49.7	Silky, lamellar.
1245	D	3/8	....do	1.498	.380	.569	30,580		55,890		21.9	51.7	Do.
1246	E	3/8	....do	1.498	.383	.574	31,360		54,430		26.5	48.4	Do.
1247	F	3/8	....do	1.499	.380	.570	28,420		54,370		26.1	51.4	Silky, very lamellar.
1248	G	3/8	....do	1.496	.366	.548	31.390		55,420		26.4	44.9	Silky, lamellar.
1249	H	3/8	....do	1.498	.372	.557	30,520		57,000		25.2	50.2	Silky, slight lamination.
1250	I	3/8	....do	1.498	.371	.556	32,730		58,130		20.7	51.6	Do.
1251	J	3/8	....do	1.498	.375	.562	31,670		58,840		27.0	51.6	Silky.
1262	K	7/16	Lengthwise.	1.496	.423	.633	33,490	32,460	59,000	58,245	24.6	49.6	Silky, slight lamination.
1263	L	7/16	....do	1.496	.438	.655	31,450		59,390		22.5	48.7	Silky, stratified.
1264	M	7/16	....do	1.496	.425	.636	33,960		61,650		24.1	53.8	Fine silky.
1265	N	7/16	....do	1.497	.411	.615	34,150		61,140		20.2	51.7	Silky, stratified, laminated.
1266	O	7/16	....do	1.500	.419	.629	31,460		52,910		29.0	59.5	Fine silky.
1267	P	7/16	....d9	1.496	.433	.618	33,020		58,090		27.5	54.6	Do
1268	Q	7/16	....do	1.498	.423	.634	30,280		56,960		30.7	56.9	Do.
1269	....	7/16	....do	1.496	.420	.628	31,850		56,820		23.8	49.7	Silky, slight lamination.
1270	K	7/16	Crosswise...	1.498	.424	.635	30,000	32,450	57,400	58,790	24.0	48.8	Silky, coarse lamination.
1271	L	7/16	....do	1.497	.438	.656	36,280		59,910		26.4	54.0	Silky.
1272	M	7/16	....do	1.497	.421	.630	30,790		59,560		24.4	48.9	Do.
1273	N	7/16	....do	1.497	.410	.614	33,220		62,050		20.8	46.1	Do.
1274	O	7/16	....do	1.497	.415	.621	32,530		[illegible], 480		27.5	44.4	Silky, stratified.
1275	P	7/16	....do	1.497	.435	.651	31,640		57,710		22.5	49.3	Silky, slight lamination.
1276	Q	7/16	....do	1.497	.417	.624	32,690		54,420		29.9	58.3	Silky.
1281	R	1/2	Lengthwise.	1.497	.488	.731	30,100	31,602	57,180	58,558	21.3	53.6	Fine silky.
1282	S	1/2	....do	1.496	.470	.703	34,990		59,050		26.0	46.4	Silky lamellar.
1283	T	1/2	....do	1.498	.480	.719	32,270		60,000		24.7	48.0	Fine silky.
1284	U	1/2	....do	1.496	.483	.723	29,050		58,000		24.6	52.1	Fine silky, slight lamination.

Tabulation of O. H. steel strips representing metal employed in riveted joints—Continued.

No. of test.	Sheet letter.	Nominal thickness.	Direction of grain.	Actual dimensions.		Sectional area.	Elastic limit.		Tensile strength.		Elongation in 10 inches.	Contraction of area.	Appearance of fracture.
				Width.	Thickness.		Per square inch.	Mean.	Per square inch.	Mean.			
		Inch.		*Inches.*	*Inch.*	*Sq. in.*	*Pounds.*		*Pounds.*		*Per ct.*	*Per ct.*	
1277	R	½	Crosswise...	1.498	.482	.722	32,960	30,270	60,480	58,378	24.6	47.8	Silky, slight lamination.
1278	S	½	....do	1.498	.466	.698	28,370		57,420		26.5	42.0	Silky, very lamellar.
1279	T	½	....do	1.496	.482	.721	28,850		58,200		24.9	53.0	Silky.
1280	U	½	....do	1.498	.484	.725	30,900		57,410		27.1	45.4	Silky, slight lamination.
1285	V	⅝	Lengthwise.	1.497	.622	.931	28,790	28,227	55,000	56,077	31.1	55.7	Silky, lamellar.
1286	W	⅝	....do	1.498	.610	.914	29,540		57,290		23.6	35.9	Silky, stratified.
1287	X	⅝	....do	1.498	.618	.926	26,350		55,940		26.1	48.7	Very rough, on one side.
1288	V	⅝	Crosswise...	1.498	.624	.935	34,650	30,793	58,160	56,077	28.7	51.4	Silky, lamellar.
1289	W	⅝	....do	1.496	.609	.911	28,760		56,870		23.8	40.3	Silky, slight lamination.
1290	X	⅝	....do	1.496	.619	.925	28,970		55,000		24.0	54.6	Do.
1294	Y	¾	Lengthwise.	1.498	.728	1.090	27,160	28,320	60,420	58,313	28.8	51.9	Do.
1293	Z	¾	....do	1.495	.722	1.079	27,800		59,000		27.9	55.1	Silky.
1295	....	¾	....do	1.501	.743	1.115	30,000		55,520		24.0	36.5	Silky, stratified.
1291	Y	¾	Crosswise ..	1.497	.746	1.117	37,610	34,845	63,600	60,185	24.1	44.9	Silky, slight lamination.
1292	Z	¾	....do	1.496	.763	1.141	32,080		56,680		27.8	52.2	Silky.

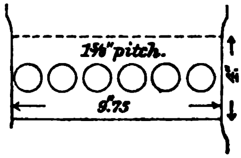
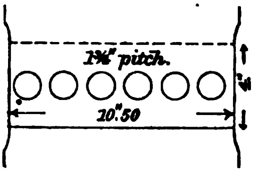
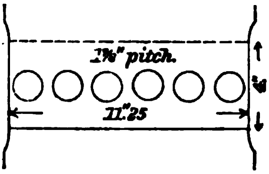
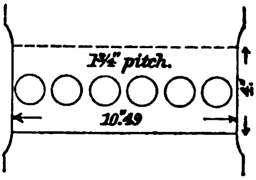
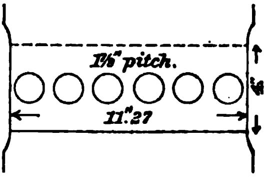
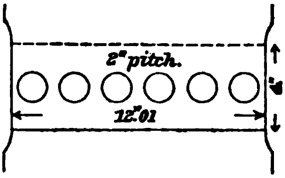
Rivet metal used in the construction of riveted joints.

No. of test.	Nominal diameter.	Actual diameter.	Sectional area.	Elastic limit.		Tensile strength.		Elongation in 10 inches.		Area at fracture.		Contraction of area.	Elongation of inch sections.
				Total.	Per square inch.	Total.	Per square inch.			Diameter.	Area.		
	Inches.	*Inches.*	*Sq. In.*	*Pounds*	*Pounds.*	*Pounds.*	*Pounds.*	*Inches.*	*Per ct.*	*Inch.*	*Sq. in.*	*Per ct.*	
1296	9/16	.54	.229	8,950	39,080	12,310	53,760	2.23	22.3	.41	.132	42.4	".21, ".17, ".19, ".19, ".18, ".22, ".21, ".23, ".48*, ".20.
1297	9/16	.54	.229	8,940	39,040	12,190	53,230	2.15	21.5	.42	.139	39.3	".21, ".18, ".20, ".17, ".17, ".20, ".18, ".23, ".40*, ".21
1298	11/16	.66	.342	14,700	42,980	20,160	58,950	2.48	24.8	.53	.221	35.4	".22, ".20, ".24, ".43*, ".24, "23, ".24, ".24, ".23, ".21.
1299	11/16	.66	.342	13,450	39,330	18,850	55,120	2.13	21.3	.51	.204	40.4	.18, .43*, .21, .19, .21, .19, .18, .18, .19, .17.
1300	13/16	.79	.490	20,240	41,310	27,620	56,870	2.05	20.5	.67	.353	28.0	.24, .24, .21, .21, .20, .20, .19, .19, .19, .18.
1301	13/16	.79	.490	20,210	41,240	27,670	56,470	2.51	25.1	.62	.302	38.4	.21, .22, .26, 42*, .28, .24, .22, .21, .21, .24.
1302	15/16	.92	.665	23,320	35,070	34,820	52,360	2.86	28.6	.69	.374	43.8	.23, .25, .23, .29, .52*, .31, .24, .24, .29, .26.
1303	15/16	.92	.665	23,980	36,060	34,880	52,450	2.62	26.2	.72	.407	38.8	.25, .24, .48*, 32, .23, .26, .22, .21, .20, .21.
1304	1 1/16	1.06	.882	30,650	34,750	46,280	52,470	2.78	27.8	.80	.503	42.9	.22, .21, .23, .25, .31, .59*, .29, .24, .23, 21.
1305	1 1/16	1.06	.882	30,700	34,810	46,610	52,850	2.81	28.1	.80	.503	42.9	.26, .43*, .45*, .26, .24, .24, .24, .26, .22, .21.
1306	1 3/16	1.17	1.075	36,400	33,860	57,620	53,600	2.74	27.4	.92	.665	38.1	".24, ".25, ".36, ".47*, ".25, ".23, ".24, ".24, ".23, ".23.
1307	1 3/16	1.17	1.075	36,550	34,000	57,300	53,300	2.18	21.8	.97	.739	31.3	.21, .19, .22, .42*, .29, .20, .17, .15, .16, .17.

Appearance of fractures fibrous.

TABULATION OF

¼" STEEL

No. of test.	Sheet letters. Plate.	Sheet letters. Covers.		Style of joint.	Nominal thickness. Plate.	Nominal thickness. Covers.	Size of rivets and holes.	Actual thickness of plate.
					Inch.	Inch.	Inch.	Inch.
1308	F	A	A		¼	3/16	9/16 and ⅝	.242
1309	F	A	A		¼	3/16	9/16 and ⅝	.242
1310	F	A	A		¼	3/16	9/16 and ⅝	.242
1311	F	A	A		¼	3/16	9/16 and ⅝	.249
1312	F	A	A		¼	3/16	9/16 and ⅝	.244
1313	F	A	A		¼	3/16	9/16 and ⅝	.243
1314	F	A	A		¼	3/16	11/16 and ¾	.248
1315	F	A	A		¼	3/16	11/16 and ¾	.242
1316	F	A	A		¼	3/16	11/16 and ¾	.244
1317	F	A	A		¼	3/16	11/16 and ¾	.240
1318	F	B	B		¼	3/16	11/16 and ¾	.245
1319	G	B	B		¼	3/16	11/16 and ¾	.240

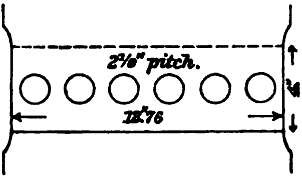
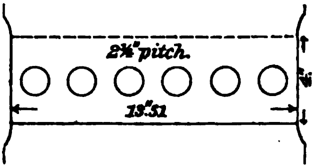
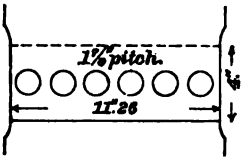
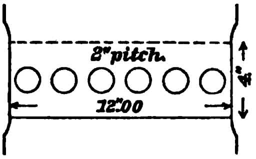
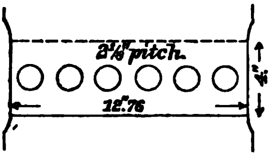
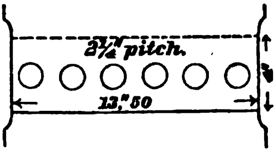
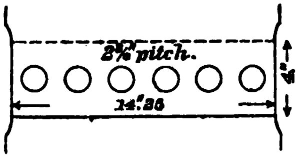
RIVETED JOINTS.

PLATE.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
2.360	1.452	.908	3.682	61,740	41,690	67,770	108,370	26,720	67.5
2.360	1.452	.908	3.682	....	42,180	68,560	109,640	27,040	68.3
2.541	1.634	.907	3.682	61,740	42,540	66,160	119,180	29,360	68.9
2.615	1.681	.934	3.682	....	43,170	67,160	119,810	30,660	69.9
2.745	1.830	.915	3.682	61,740	44,920	67,380	134,750	33,490	72.8
2.739	1.827	.912	3.682	....	44,520	66,750	133,720	33,120	72.1
2.602	1.486	1.116	5.300	61,740	40,700	71,270	94,800	19,980	65.9
2.541	1.452	1.089	5.300	....	40,000	70,000	93,330	19,180	64.8
2.750	1.652	1.098	5.300	61,740	40,980	68,210	102,630	21,260	66.4
2.772	1.665	1.107	5.300	....	41,430	68,980	103,750	21,670	67.1
2.942	1.840	1.102	5.300	61,740	42,180	67,450	112,610	23,420	68.3
2.882	1.802	1.080	5.300	62,660	43,000	68,770	114,750	23,880	68.6

TABULATION OF

¼" STEEL

No. of test.	Sheet letters.			Style of joint.	Nominal thickness.		Size of rivets and holes.	Actual thickness of plate.
	Plate.	Covers.			Plate.	Covers.		
					Inch.	*Inch.*	*Inch.*	*Inch.*
1320 1321	G G	B B	B B		¼ ¼	3/16 3/16	11/16 and ¾ 11/16 and ¾	.243 .243
1322 1323	H H	D D	D C		¼ ¼	3/16 3/16	11/16 and ¾ 11/16 and ¾	.245 .247
1324 1325	F F	A A	A A		¼ ¼	3/16 3/16	13/16 and ⅞ 13/16 and ⅞	.248 .245
1326 1327	G G	B B	B B		¼ ¼	3/16 3/16	13/16 and ⅞ 13/16 and ⅞	.241 .242
1328 1329	G G	B C	C C		¼ ¼	3/16 3/16	13/16 and ⅞ 13/16 and ⅞	.241 .242
1330 1331	L H	C C	D D		¼ ¼	3/16 3/16	13/16 and ⅞ 13/16 and ⅞	.248 .246
1332 1333	H H	D D	E E		¼ ¼	3/16 3/16	13/16 and ⅞ 13/16 and ⅞	.248 .248

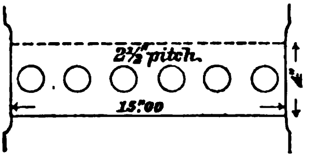
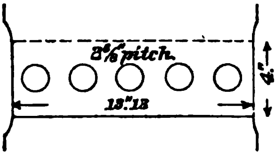
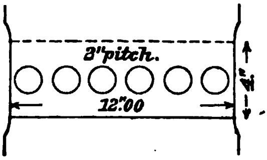
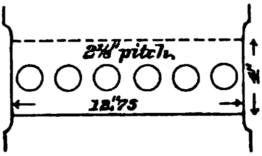
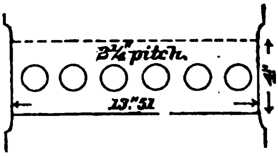
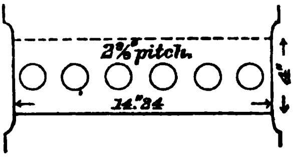
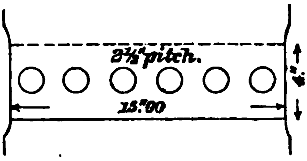
RIVETED JOINTS—Continued.

PLATE—Continued.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
3.100	2.007	1.093	5.300	62,060	43,060	66,520	122,140	25,190	68.7
3.100	2.007	1.093	5.300	....	44,030	68,000	124,880	25,750	70.8
3.310	2.207	1.103	5.300	59,180	43,040	64,540	129,150	26,880	72.7
3.337	2.225	1.112	5.300	....	43,810	65,700	131,460	27,580	74.0
2.792	1.490	1.302	7.216	61,740	38,650	72,480	82,870	14,950	62.6
2.756	1.470	1.286	7.216	....	39,430	73,930	84,510	15,010	63.8
2.892	1.627	1.265	7.216	62,660	40,340	71,700	92,210	16,170	64.4
2.909	1.638	1.271	7.216	....	41,280	73,310	94,480	16,640	65.9
3.075	1.810	1.265	7.216	62,660	42,290	71,850	102,810	18,020	67.5
3.088	1.817	1.271	7.216	....	42,750	72,650	103,860	18,290	68.2
3.348	2.046	1.302	7.216	61,470	43,100	70,530	110,830	20,000	70.1
3.321	2.029	1.291	7.216	59,180	41,450	67,840	106,620	19,080	70.0
3.534	2.232	1.302	7.216	59,180	41,820	66,210	113,500	20,480	70.7
3.534	2.232	1.302	7.216	....	42,700	67,710	116,070	20,940	72.3

TABULATION OF

¼" STEEL

No. of test.	Sheet letters.			Style of joint.	Nominal thickness.		Size of rivets and holes.	Actual thickness of plate.
	Plate.	Covers.			Plate.	Covers.		
					Inch.	*Inch.*	*Inch.*	*Inch.*
1334	M	E	E		¼	3/16	11/16 and ¾	.243
1335	O				¼	3/16	11/16 and ¾	.245
1336	H	C	C		¼	3/16	13/16 and ⅞	.238
1337	L	C	C		¼	3/16	13/16 and ⅞	.252
1338	G	B	B		¼	3/16	15/16 and 1	.238
1339	F	B	B		¼	3/16	15/16 and 1	.248
1340	G	B	C		¼	3/16	15/16 and 1	.240
1341	G	C	C		¼	3/16	15/16 and 1	.242
1342	L	C	D		¼	3/16	15/16 and 1	.250
1343	L	D	D		¼	3/16	15/16 and 1	.250
1344	L	D	E		¼	3/16	15/16 and 1	.250
1345	H	D	E		¼	3/16	15/16 and 1	.247
1346	I	E	E		¼	3/16	15/16 and 1	.251
1347	I	E	E		¼	3/16	15/16 and 1	.252

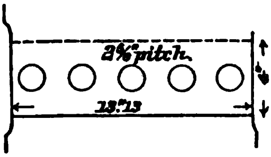
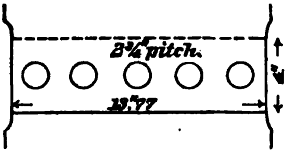
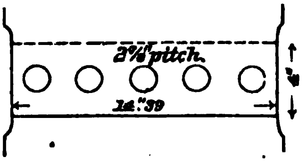
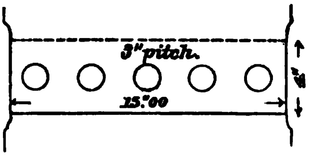
RIVETED JOINTS—Continued.

PLATE—Continued.

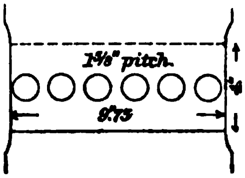
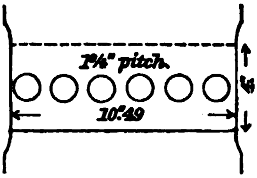
Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
3.645	2.369	1.276	7.216	58,170	44,650	68,700	127,550	22,550	76.8
3.675	2.389	1.286	7.216	64,170	43,050	66,230	123,030	21,930	67.1
3.125	2.084	1.041	6.013	59,180	41,310	61,960	124,020	21,470	69.8
3.309	2.206	1.103	6.013	61,470	42,000	62,990	125,990	23,110	68.3
2.856	1.428	1.428	9.425	62,660	40,620	81,230	81,230	12,310	64.8
2.976	1.488	1.488	9.425	61,740	36,290	72,580	72,580	11,460	58.8
3.060	1.620	1.440	9.425	62,660	38,660	73,020	82,156	12,550	61.7
3.088	1.636	1.452	9.425	....	38,000	71,730	80,820	12,450	60.6
3.378	1.878	1.500	9.425	61,470	37,800	68,000	85,130	13,550	61.5
3.375	1.875	1.500	9.425	....	39,000	70,200	87,750	13,970	63.4
3.560	2.060	1.500	9.425	61,470	39,130	67,640	92,870	14,780	63.6
3.520	2.038	1.482	9.425	59,180	40,450	69,860	96,070	15,110	68.3
3.765	2.259	1.506	9.425	60,480	43,590	72,640	108,960	17,410	72.1
3.780	2.268	1.512	9.425	....	41,420	69,030	103,540	16,610	68 5

TABULATION OF

$\frac{1}{4}$" STEEL

No. of test.	Sheet letters.			Style of joint.	Nominal thickness.		Size of rivets and holes.	Actual thickness of plate.
	Plate.	Covers.			Plate.	Covers.		
					Inch.	*Inch.*	*Inch.*	*Inch.*
1348 1349	H G	C C	C C		$\frac{1}{4}$ $\frac{1}{4}$	$\frac{3}{16}$ $\frac{3}{16}$	$\frac{15}{16}$ and 1 $\frac{15}{16}$ and 1	.244 .239
1350 1351	N N	D D	D D		$\frac{1}{4}$ $\frac{1}{4}$	$\frac{3}{16}$ $\frac{3}{16}$	$\frac{15}{16}$ and 1 $\frac{15}{16}$ and 1	.250 .249
1552 1353	H H	D E	D E		$\frac{1}{4}$ $\frac{1}{4}$	$\frac{3}{16}$ $\frac{3}{16}$	$\frac{15}{16}$ and 1 $\frac{15}{16}$ and 1	.247 .248
1354 1355	I I	E E	E E		$\frac{1}{4}$ $\frac{1}{4}$	$\frac{3}{16}$ $\frac{3}{16}$	$\frac{15}{16}$ and 1 $\frac{15}{16}$ and 1	.252 .251

$\frac{3}{8}$" STEEL

1356 1357	A A	I I	I I		$\frac{3}{8}$ $\frac{3}{8}$	$\frac{1}{4}$ $\frac{1}{4}$	$\frac{9}{16}$ and $\frac{5}{8}$ $\frac{9}{16}$ and $\frac{5}{8}$	.365 .364
1358 1359	A A	I J	J J		$\frac{3}{8}$ $\frac{3}{8}$	$\frac{1}{4}$ $\frac{1}{4}$	$\frac{9}{16}$ and $\frac{5}{8}$ $\frac{9}{16}$ and $\frac{5}{8}$	.365 .366

RIVETED JOINT—Continued.

PLATE—Continued.

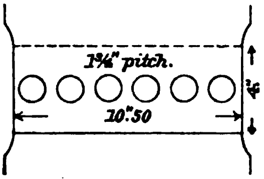
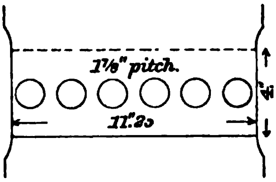
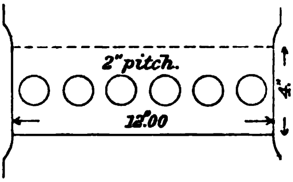
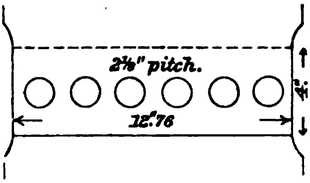
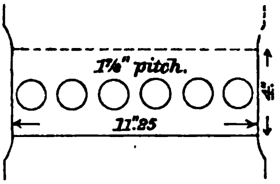
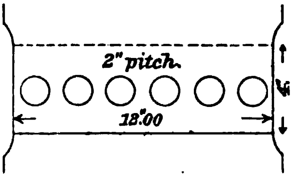
Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
3.204	1.984	1.220	7.854	59,180	38,700	62,490	101,620	15,790	65.4
3.131	1.936	1.195	7.854	62,660	42,890	69,370	112,380	17,100	68.4
3.442	2.192	1.250	7.854	55,740	42,960	67,460	118,300	18,830	77.1
3.426	2.181	1.245	7.854	....	41,780	65,640	114,980	18,230	74.9
3.554	2.319	1.235	7.854	59,180	43,510	66,690	125,220	19,690	73.5
3.569	2.329	1.240	7.854	....	43,830	67,170	126,160	19,920	74.1
3.780	2.520	1.260	7.854	60,480	44,580	66,870	133,730	21,450	73.7
3.765	2.510	1.255	7.854	....	44,410	66,610	133,230	21,290	73.4

PLATE.

3.559	2.190	1.369	3.682	54,260	40,460	65,740	105,170	39,100	74.6
3.549	2.184	1.365	3.682	....	39,420	64,060	102,490	38,000	72.6
3.829	2.460	1.369	3.682	54,260	39,780	61,910	111,250	41,360	73.3
3.843	2.471	1.372	3.682	....	39,060	60,740	109,400	40,770	72.0

TABULATION OF

3/8″ STEEL

No. of test.	Sheet letters.			Style of joint.	Nominal thickness.		Size of rivets and holes.	Actual thickness of plate.
	Plate.	Covers.			Plate.	Covers.		
					Inch.	*Inch.*	*Inch.*	*Inch.*
1360 1361	A A	I I	J I		3/8 3/8	1/4 1/4	11/16 and 3/4 11/16 and 3/4	.366 .367
1362 1363	A A	J J	J J		3/8 3/8	1/4 1/4	11/16 and 3/4 11/16 and 3/4	.366 .365
1364 1365	B B	K K	K K		3/8 3/8	1/4 1/4	11/16 and 3/4 11/16 and 3/4	.388 .390
1366 1367	C B	K K	K L		3/8 3/8	1/4 1/4	11/16 and 3/4 11/16 and 3/4	.367 .387
1368 1369	A A	J J	J J		3/8 3/8	1/4 1/4	13/16 and 7/8 13/16 and 7/8	.369 .366
1370 1371	B B	K J	K J		3/8 3/8	1/4 1/4	13/16 and 7/8 13/16 and 7/8	.389 .388

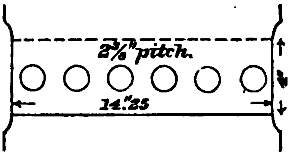
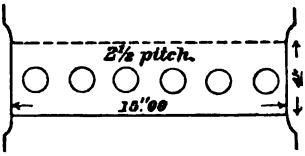
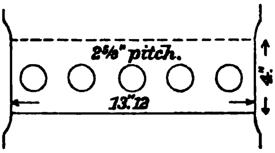
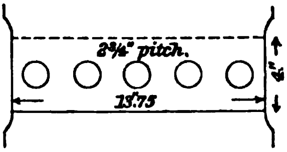
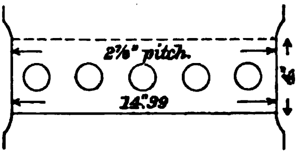
RIVETED JOINTS—Continued.

PLATE—Continued.

Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
3.843	2.196	1.647	5.300	54,260	37,000	64,750	86,330	26,830	68.2
3.854	2.202	1.652	5.300	....	37,050	64,840	86,430	26,940	68.3
4.118	2.471	1.647	5.300	54,260	37,450	62,400	93,620	29,090	69.0
4.106	2.464	1.642	5.300	....	38,040	63,390	95,130	29,470	70.1
4.656	2.910	1.746	5.300	59,730	41,820	66,910	111,510	36,730	70.0
4.680	2.925	1.755	5.300	....	42,000	67,200	112,000	37,090	70.3
4.683	3.031	1.652	5.300	57,870	41,040	63,410	116,340	36,260	70.9
4.938	3.197	1.741	5.300	59,730	40,910	63,180	116,030	38,110	68.5
4.151	2.214	1.937	7.216	54,260	35,000	65,620	75,000	20,130	64.5
4.114	2.192	1.922	7.216	....	34,180	64,140	73,150	19,480	63.0
4.668	2.626	2.042	7.216	59,730	36,870	65,540	84,280	23,850	61.7
4.656	2.619	2.037	7.216	....	38,940	69,220	89,000	25,120	65.2

TABULATION OF

⅜" STEEL

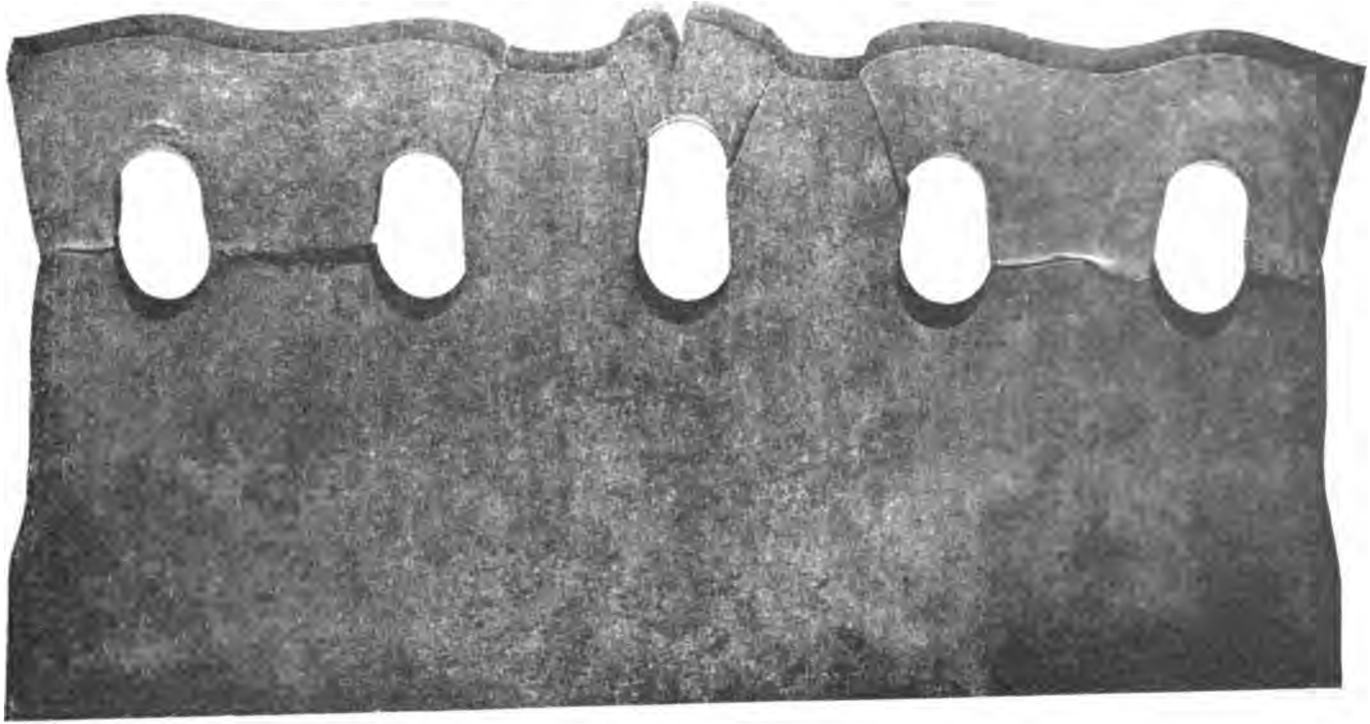
No. of test.	Sheet letters.			Style of joint.	Nominal thickness.		Size of rivets and holes.	Actual thickness of plate.
	Plate.	Covers.			Plate.	Covers.		
					Inch.	*Inch.*	*Inch.*	*Inch.*
1386	H	L	L		⅜	¼	$\frac{15}{16}$ and 1	.368
1387	G	L	M		⅜	¼	$\frac{15}{16}$ and 1	.365
1388	D	M	M		⅜	¼	$\frac{15}{16}$ and 1	.385
1389	D	M	M		⅜	¼	$\frac{15}{16}$ and 1	.386
1390	C	G	G		⅜	¼	$\frac{15}{16}$ and 1	.372
1391	C	H	L		⅜	¼	$\frac{15}{16}$ and 1	.369
1392	C	L	L		⅜	¼	$\frac{15}{16}$ and 1	.374
1393	C	L	N		⅜	¼	$\frac{15}{16}$ and 1	.372
1394	D	I	M		⅜	¼	$\frac{15}{16}$ and 1	.386
1395	D	M	M		⅜	¼	$\frac{15}{16}$ and 1	.383

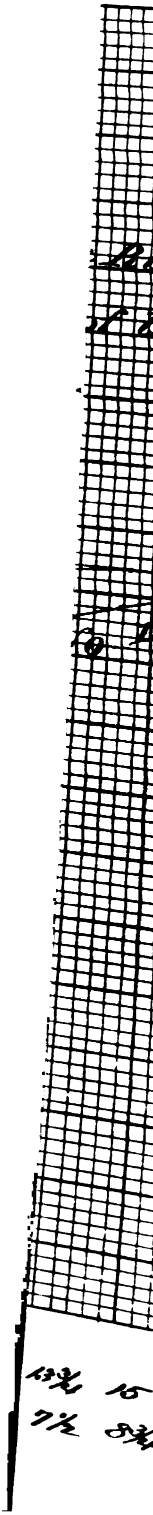
RIVETED JOINTS—Continued.

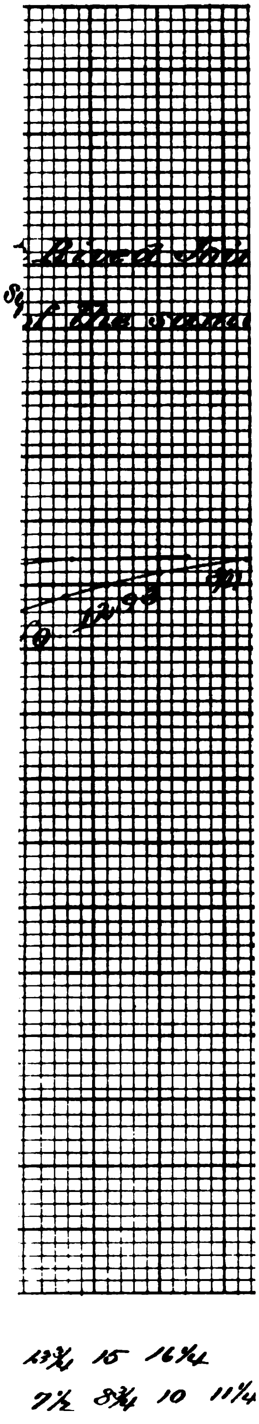
PLATE—Continued.

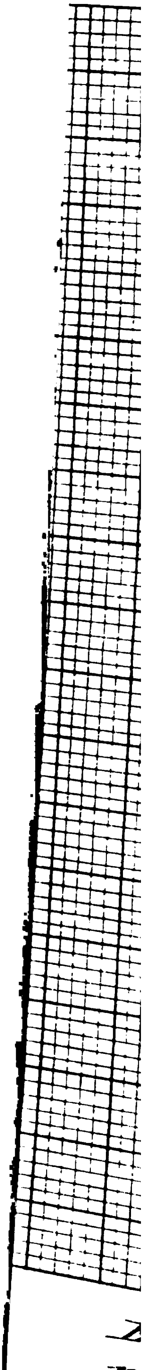
Sectional area of plate.		Bearing surface of rivets.	Shearing area of rivets.	Tensile strength of plate, pounds per square inch.	Maximum stress on joint per square inch.				Efficiency of joint.
Gross.	Net.				Tension on gross section of plate.	Tension on net section of plate.	Compression on bearing surface of rivets.	Shearing on rivets.	
Sq. inch.	*Sq. inch.*	*Sq. inch.*	*Sq. inch.*		*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Per cent.*
5.244	3.036	2.208	9.425	56,670	37,010	63,930	87,910	20,590	65.3
5.205	3.015	2.190	9.425	53,840	36,750	63,450	87,350	20,300	68.2
5.775	3.465	2.310	9.425	53,730	37,490	62,480	93,710	22,970	69.8
5.790	3.474	2.316	9.425	....	37,360	62,260	93,390	21,890	69.5
4.881	3.021	1.860	7.854	57,870	39,000	63,010	102,340	24,240	67.4
4.841	2.996	1.845	7.854	....	39,520	63,850	103,690	24,360	68.3
5.143	3.273	1.870	7.854	57,870	39,840	62,590	109,540	26,080	68.9
5.111	3.231	1.860	7.854	....	40,420	63,550	111,070	26,310	69.8
5.555	3.625	1.930	7.854	53,730	39,340	60,290	113,240	27,830	73.2
5.496	3.581	1.915	7.854	....	40,300	61,850	115,660	28,200	75.0

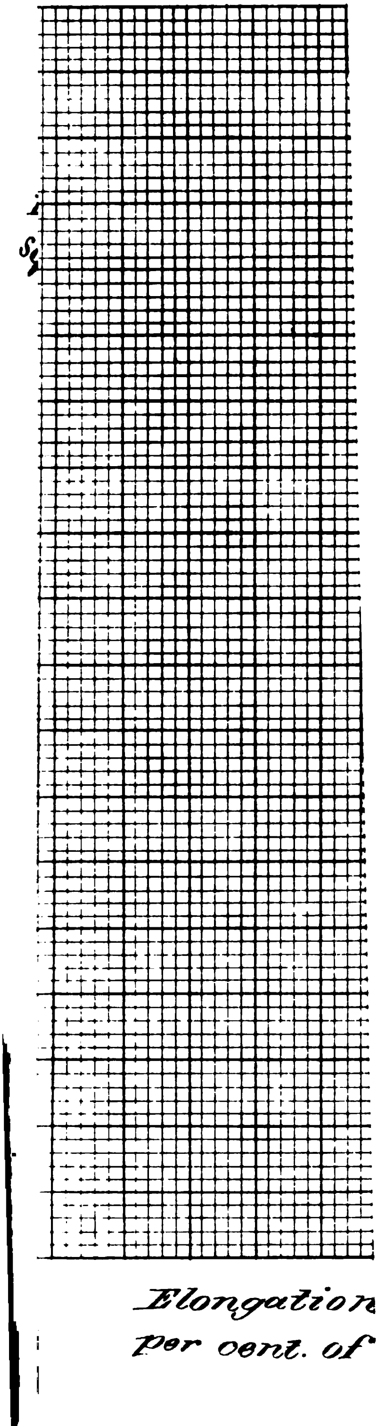
PHOTOGRAPH OF PLATE IN JOINT No. 1355, AFTER FRACTURE.




13¾
15
7½
8


of the same
13¾ 15 16¼
7½ 8¾ 10 11¼



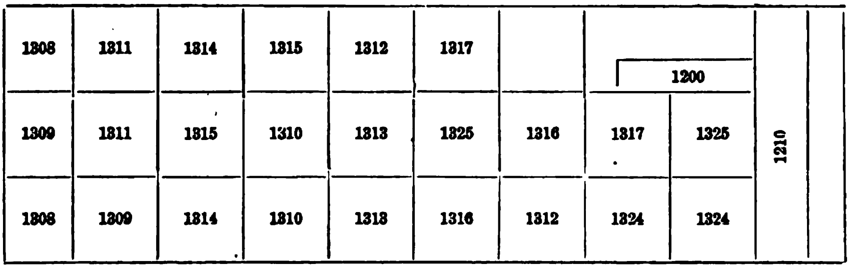

Elongation
per cent. of

DRAWINGS

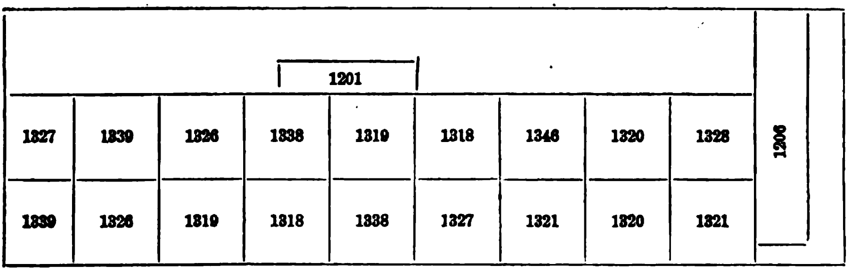
SHOWING

LOCATION OF TEST STRIPS AND PLATES IN THE ORIGINAL SHEETS.

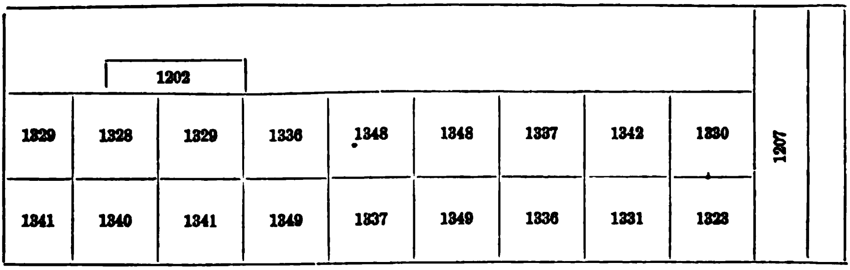
SHEET A.—$\frac{3}{16}$″ *steel plate.*



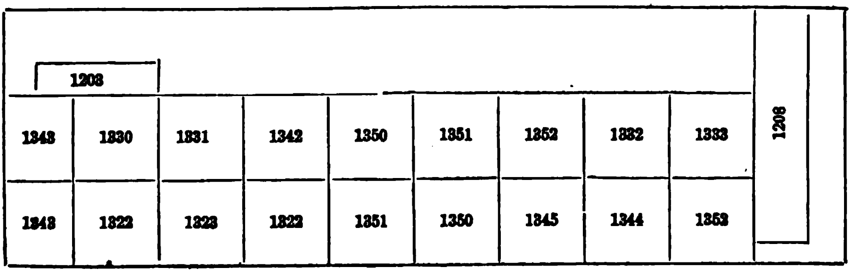
SHEET B.—$\frac{3}{16}$″ *steel plate.*



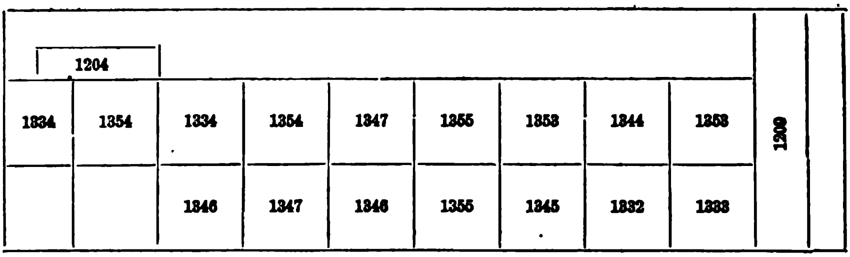
SHEET C.—$\frac{3}{16}$″ *steel plate.*



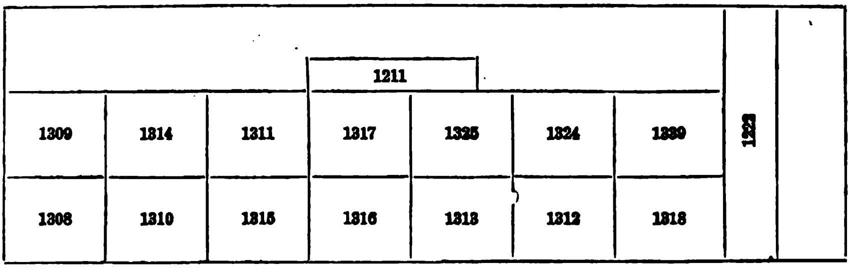
SHEET D.—$\frac{3}{16}$″ *steel plate.*



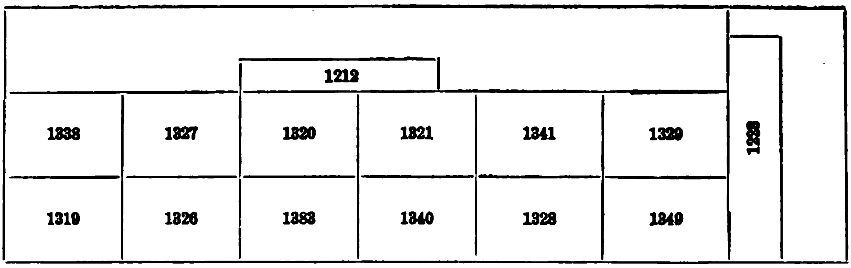
SHEET E.—$\frac{3}{16}$″ *steel plate.*



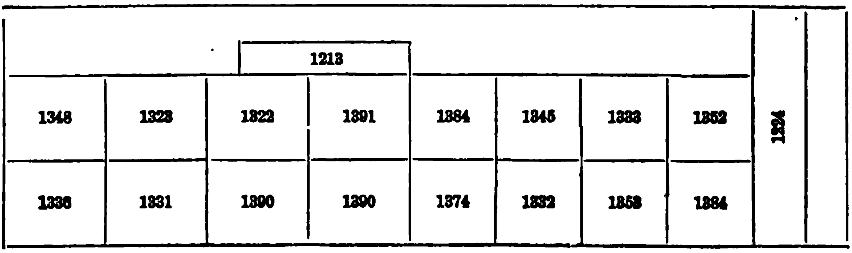
SHEET F.—$\frac{1}{4}$″ *steel plate.*



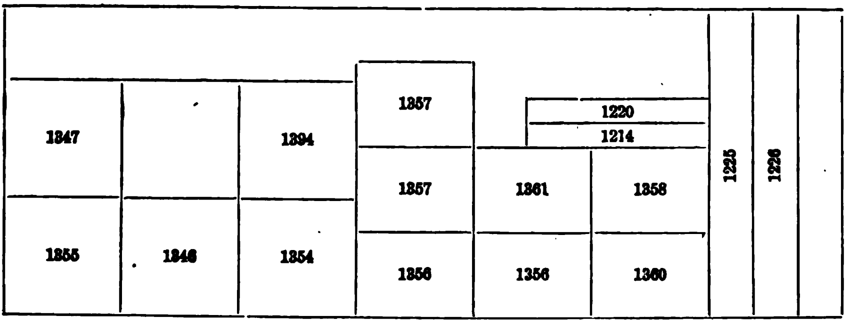
SHEET G.—$\frac{1}{4}$″ *steel plate.*



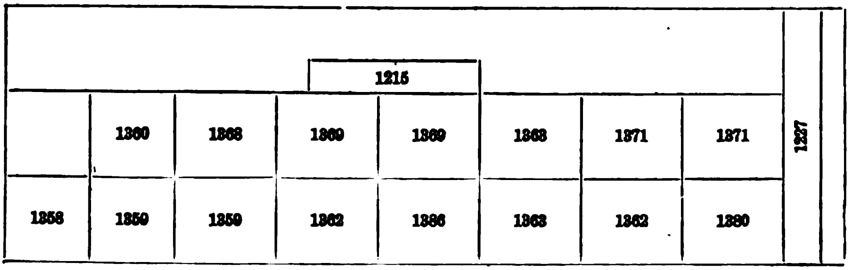
SHEET H.—$\frac{1}{4}$″ *steel plate.*



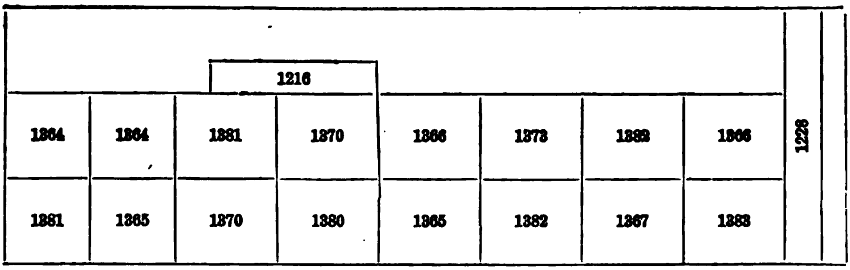
SHEET I.—¼″ *steel plate.*



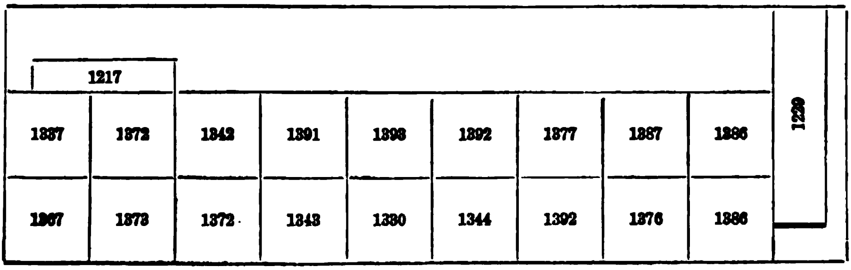
SHEET J.—¼″ *steel plate.*



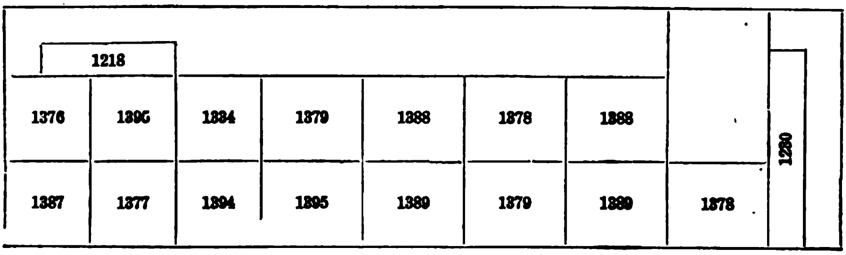
SHEET K.—¼″ *steel plate.*



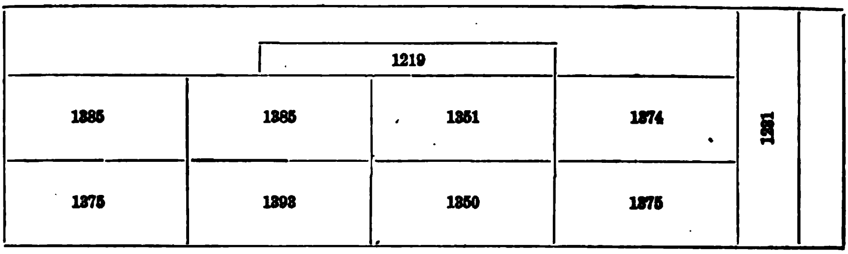
SHEET L.—¼″ *steel plate.*



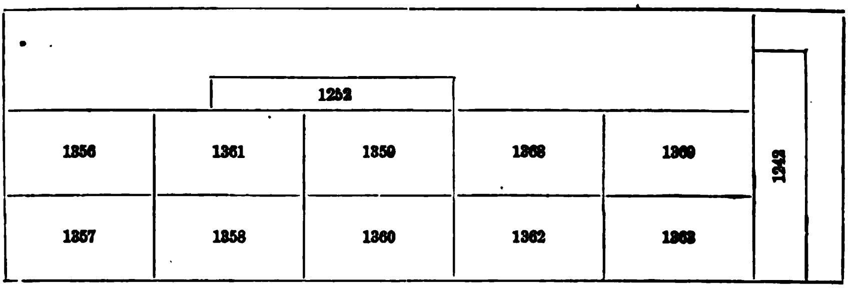
SHEET M.—¼″ *steel plate.*



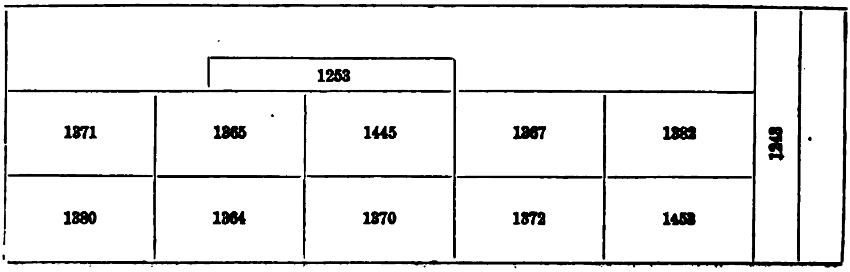
SHEET N.—¼″ *steel plate.*



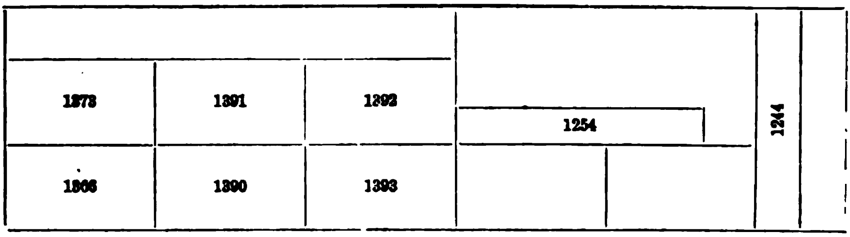
SHEET A.—⅜″ *steel plate.*



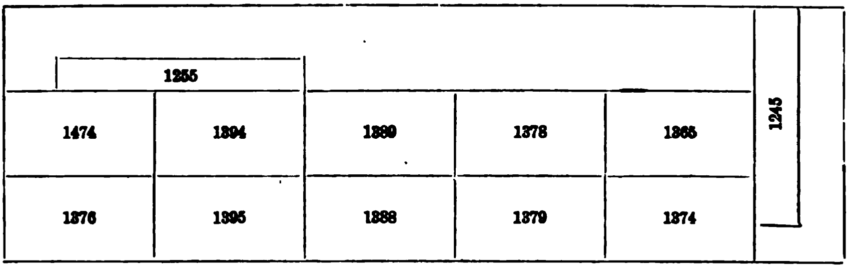
SHEET B.—⅜″ *steel plate.*



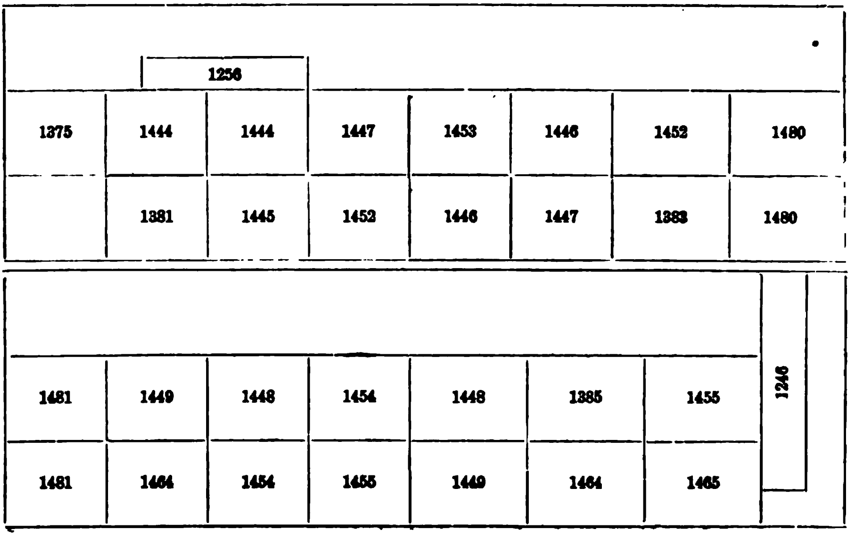
SHEET C.—$\frac{3}{8}$″ *steel plate.*



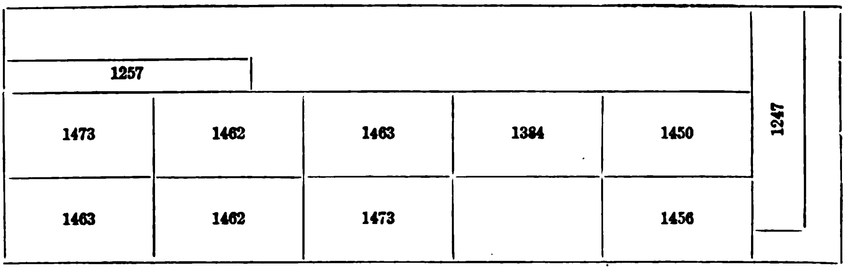
SHEET D.—$\frac{3}{8}$″ *steel plate.*



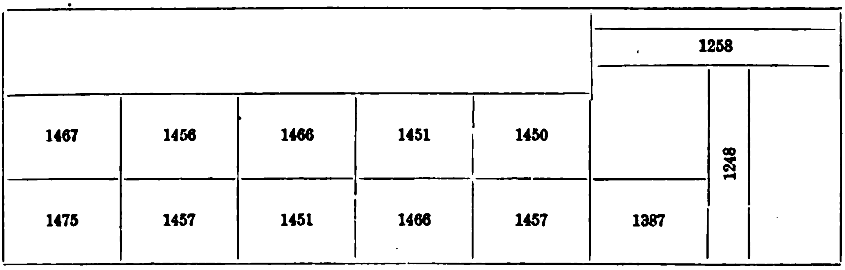
SHEET E.—$\frac{3}{8}$″ *steel plate.*



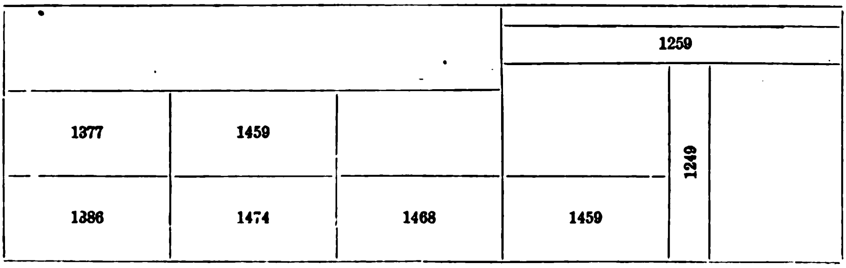
SHEET F.—⅜″ *steel plate.*



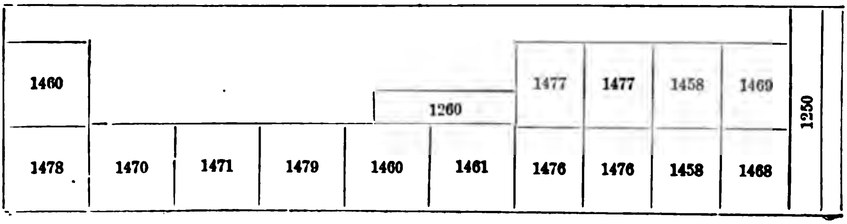
SHEET G.—⅜″ *steel plate.*



SHEET H.—⅜″ *steel plate.*



SHEET I.—⅜″ *steel plate.*



20.—STEEL SPECIMENS FROM THE SHAFTS OF THE CRUISERS BOSTON, ATLANTA, AND CHICAGO, AND THE DISPATCH BOAT DOLPHIN.

The shafts were made of open hearth steel; 30″ ingots by about 9′ long, and weighing from 17,000 to 23,000 pounds, were forged down to the diameters of the shafts, 14″ and 16″ diameter in the rough, and finished to 13″ and 14½″.

The forging was done with a 10-ton hammer, 36″ cylinder, and 8′ stroke, worked with 70 pounds steam. The drop upon the ingot varied from 1′ to 4′.

The middle of the length of the ingot was first forged down to size, then working towards either end from this section.

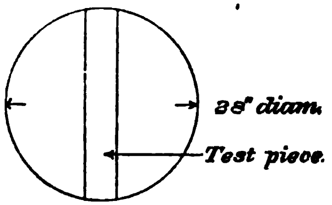
The marks on the specimens are the heat numbers of the casts of steel. Analyses made by the steel company are as follows:

Heats.	Carbon.	Manganese.
	Per cent.	*Per cent.*
3487	0.36	0.53
3637	0.33	0.64
3639	0.29	0.46
3641	0.31	0.55
3656	0.28	0.70
3711	0.30	0.70
3730	0.28	0.70
3741	0.29	0.90
3753	0.30	0.80

Specimens from heats 3637 and 3639 were taken from a 12″ ingot, poured from the same melt as the large 30″ ingot, and forged down to about 6″ ingot, then the specimens were taken from the middle of the ingot longitudinally.

Specimens 3711 and 3656 were taken from the shaft, from what was the top end of the ingot, and billeted down to 6″ or 7″ square, then cutting out the test pieces longitudinally.

Specimens 3753, 3730, 3641, 3487, and 3741, were taken from bottom of ingot, in squaring up the coupling end of shafts under the hammer, from pieces 4″ to 5″ thick, which were hammered down to about one-half their thickness. The test pieces then cut out from the same, thus:



Specimens from the new shaft of the Dolphin, Nos. 3787_1 to 3787_4 were cut out from shaft longitudinally and tested in the condition they came from the shaft.

Specimens Nos. 3687. to 3787 .... were cut out of shaft and then forged down to specimen size. The results of the tests show how far the ductility of the metal was improved by this extra hammer work.

STEEL SPECIMENS FROM THE SHAFT OF THE BOSTON.

No. 495.

Tension Test.

Mark on bar, 3487.
Sectional area, 1″.490 ×″.500=.745 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
745	1,000	0.	0.	0.	0.	Initial load.
3,725	5,000	.000100	.000100	0.	....	
7,450	10,000	.000263	.000163	0.	....	
11,175	15,000	.000425	.000162	0.	....	
14,900	20,000	.000600	.000175	0.	....	
18,625	25,000	.000788	.000188	0.	....	
22,350	30,000	.000950	.000162	.000013	.000013	
26,075	35,000	.001113	.000163	.000013	0.	
29,800	40,000	.001313	.000200	.000013	0.	
33,525	45,000	.001475	.000162	.000013	0.	
37,250	50,000	.001663	.000188	.000025	.000012	
39,500	53,020	.001813	.000150	....	....	Elastic limit.
40,000	....	.002400	.000587	....	....	
40,500	....	.003400	.001000	....	....	
40,975	55,000	.004050	.000650	....	....	
41,500	....	.006288	.002238	....	....	
42,000	....	.007925	.001637	....	....	
42,500	....	.008350	.000425	....	....	
43,000	....	.009025	.000675	....	....	
43,500	....	.009600	.000575	....	....	
44,000	....	.010188	.000588	....	....	
44,700	60,000	.011250	.001062	....	....	
46,000	....	.0150	.003750	....	....	
48,000	....	.0175	.0025	....	....	
50,000	....	.0200	.0025	....	....	
52,000	....	.0225	.0025	....	....	
54,000	....	.0263	.0038	....	....	
56,000	....	.0300	.0037	....	....	
58,000	....	.0338	.0038	....	....	
60,000	....	.0400	.0062	....	....	
63,000	....	.0475	.0075	....	....	
64,000	....	.0563	.0088	....	....	
66,000	....	.0675	.0112	....	....	
68,000	....	.0850	.0175	....	....	
69,780	93,660	.1500	.0650	....	....	Tensile strength.
58,000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.2063.

Elongation of inch sections, ″.14, ″.17, ″.16, ″.21 (″.44 fractured section), ″.27, ″.15, ″.11.

Area at fracture, 1″.18×″.38=.448 square inch.

Contraction of area, 39.8 per cent.

Appearance of fracture silky, slightly granular, spongy center.

No. 496.

Tension Test.

Marks on bar, 3487..
Sectional area, 1″.495 × ″.496 = .742 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
742	1, 000	0.	0.	0.	0.	Initial load.
3, 710	5, 000	.000100	.000100	0.	....	
7, 420	10, 000	.000250	.000150	0.	....	
11, 130	15, 000	.000425	.000175	0.	....	
14, 840	20, 000	.000588	.000163	0.	....	
18, 530	25, 000	.000763	.000175	0.	....	
22, 260	30, 000	.000925	.000162	0.	....	
25, 970	35, 000	.001087	.000162	0.	....	
29, 680	40, 000	.001262	.000175	0.	....	
33, 390	45, 000	.001450	.000188	0.	....	
37, 100	50, 000	.001613	.000163	0.	....	
40, 000	....	.001825	.000212	....	....	
40, 500	54, 580	.001888	.000063	....	....	Elastic limit.
40, 810	55, 000	.002000	.000112	.000150	.000150	
41, 500	....	.002213	.000213	....	....	
42, 000	....	.002538	.000325	....	....	
42, 500	....	.003267	.000749	....	....	
43, 000	....	.004363	.001076	....	....	
43, 500	....	.005100	.000737	....	....	
44, 000	....	.006188	.001068	....	....	
44, 520	60, 000	.006663	.000475	.004613	.004463	
45, 000	....	.007225	.000562	....	....	
45, 500	....	.007625	.000400	....	....	
46, 000	....	.008150	.000525	....	....	
46, 500	....	.008875	.000725	....	....	
47, 000	....	.009425	.000550	....	....	
47, 500	....	.010275	.000850	....	....	
48, 000	....	.010850	.000575	....	....	
49, 000	....	.011938	.001088	....	....	
50, 000	....	.013375	.001437	....	....	
51, 000	....	.014438	.001063	....	....	
52, 000	....	.015850	.001412	....	....	
53, 000	....	.017088	.001238	....	....	
54, 000	....	.0188	.001712	....	....	
56, 000	....	.0225	.0037	....	....	
58, 000	....	.0250	.0025	....	....	
60, 000	....	.0288	.0038	....	....	
62, 000	....	.0338	.0050	....	....	
64, 000	....	.0375	.0037	....	....	
66, 000	....	.0438	.0063	....	....	
68, 000	....	.0513	.0075	....	....	
70, 000	....	.0625	.0112	....	....	
72, 000	97, 040	.0888	.0263	....	....	Tensile strength.
64, 500	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1350.

Elongation of inch of sections, ″.06, ″.05, ″.07, ″.06, ″.19 (″.43 fractured section), ″.14, ″.08.

Area at fracture, 1″.20 × ″.37 = .444 square inch.

Contraction of area, 40.2 per cent.

Appearance of fracture silky, slightly granular, spongy center.

No. 497.

Tension Test.

Marks on bar, 3487 . . .
Sectional area, 1″.495 × ″.493 = .737 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
737	1, 000	0.	0.	0.	0.	Initial load.
3, 685	5, 000	.000100	.000100	0.	....	
7, 370	10, 000	.000275	.000175	0.	....	
11, 055	15, 000	.000438	.000163	0.	....	
14, 740	20, 000	.000588	.000150	.000013	.000013	
18, 425	25, 000	.000763	.000175	.000013	0.	
22, 110	30, 000	.000938	.000175	.000025	.000012	
25, 795	35, 000	.001100	.000162	.000025	0.	
29, 480	40, 000	.001288	.000188	.000038	.000013	
33, 165	45, 000	.001463	.000175	.000038	0.	
36, 850	50, 000	.001625	.000162	.000050	.000012	
38, 000	....	.001688	.000063	....	....	
39, 000	....	.001725	.000037	....	....	
40, 000	....	.001775	.000050	....	....	
41, 000	....	.001825	.000050	....	....	
42, 000	....	.001863	.000038	....	....	
43, 000	....	.001913	.000050	....	....	
44, 000	....	.001963	.000050	....	....	
45, 000	....	.002013	.000050	....	....	
46, 000	62, 420	.002063	.000050	....	....	Elastic limit.
47, 000	....	.002138	.000075	....	....	
48, 000	....	.002325	.000187	....	....	
49, 000	....	.022688	.000363	....	....	
50, 000	....	.023700	.001012	....	....	
52, 000	....	.026250	.001550	....	....	
54, 000	....	.030000	.003750	....	....	
56, 000	....	.034375	.004375	....	....	
58, 000	....	.039250	.004875	....	....	
60, 000	....	.045000	005750	....	....	
62, 000	....	.055250	.010250	....	....	
64, 000	....	.0675	.012250	....	....	
66, 000	....	.0800	.0125	....	....	
68, 000	....	.1050	.0250	....	....	
68, 450	92, 880	.1325	.0275	....	....	Tensile strength.
60, 300	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1738.

Elongation of inch sections: ″.12 (″.42 fractured section), ″.28, ″.15, ″.12, ″.11, ″.10, ″.09.

Area at fracture 1″.17 × ″.36 = ″.421 square inch.

Contraction of area, 42.9 per cent.

Appearance of fracture, fine granular, radiating from spongy center. Fine silky edges.

No. 498.

Marks on bar, 3487.....
Sectional area, 1''.493 × ''.498 = .744 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
744	1,000	0.	0.	0.	0.	Initial load.
3,720	5,000	.000088	.000088	0.	....	
7,440	10,000	.000238	.000150	0.	....	
11,160	15,000	.000400	.000162	0.	....	
14,880	20,000	.000550	.000150	0.	....	
18,600	25,000	.000713	.000163	0.	....	
22,320	30,000	.000900	.000187	.000013	.000013	
26,040	35,000	.001050	.000150	.000013	0.	
29,760	40,000	.001200	.000150	.000013	0.	
33,480	45,000	001388	.000188	.000013	0.	
37,200	50,000	.001550	.000162	.000013	0.	
39,000	....	.001663	.000113	....	....	
40,000	....	.001688	.000025	....	....	
41,000	....	.001725	.000037	....	....	
42,000	....	.001775	.000050	....	....	
43,000	....	.001813	.000038	....	....	
44,000	....	.001863	.000050	....	....	
45,000	60,480	.001925	.000062	....	....	Elastic limit.
46,000	....	.002025	.000100	....	....	
47,000	....	.002163	.000138	....	....	
48,000	....	.002488	.000325	....	....	
49,000	....	.003163	.000650	....	....	
50,000	....	.003913	.000750	....	....	
52,000	....	.006250	.002337	....	....	
54,000	....	.008500	.002250	....	....	
56,000	....	.011000	.002500	....	....	
58,000	....	.013750	.002750	....	....	
60,000	....	.016625	.002875	....	....	
62,000	....	.020250	.003625	....	....	
64,000	....	.023500	.003250	....	....	
66,000	....	.027750	.004250	....	....	
68,000	....	.032250	.004500	....	....	
70,000	....	.038875	.006625	....	....	
72,000	....	.0512	.012325	....	....	
74,000	....	.0650	.0138	....	....	
74,900	100,670	.0863	.0213	....	....	Tensile strength.
67,400	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0''.1138.

Elongation of inch sections, ''.06, ''.05, ''.06, ''.06, ''.08, ''.08 (''.27 fractured section), ''.25.

Area at fracture, 1''.22 × ''.39 = ''.476 square inch.

Contraction of area, 36.0 per cent.

Appearance of fracture silky, slightly granular, spongy center.

No. 499.

Marks on bar, 3637.
Sectional area, 1″.502×″.505=″.758 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
758	1,000	0.	0.	0.	0.	Initial load.
3,790	5,000	.000088	.000088	....	....	
7,580	10,000	.000225	.000137	....	....	
11,370	15,000	.000375	.000150	....	....	
15,160	20,000	.000518	.000138	....	....	
18,950	25,000	.000700	.000187	....	....	
22,740	30,000	.000863	.000163	....	....	
26,530	35,000	.001018	.000150	....	....	
30,320	40,000	.001200	.000187	....	....	
34,110	45,000	.001363	.000163	....	....	
37,300	49,210	.001500	.000137	....	....	Elastic limit.
37,500	50,000	.009375	.007875	....	....	
38,000	....	.009700	.000325	....	....	
39,000	....	.010625	.000925	....	....	
40,000	....	.011500	.000875	....	....	
41,000	....	.012900	.001400	....	....	
42,000	....	.013625	.000725	....	....	
43,000	....	.015000	.001375	....	....	
44,000	....	.016250	.001250	....	....	
45,000	....	.017625	.001375	....	....	
46,000	....	.019000	.001375	....	....	
47,000	....	.020500	.001500	....	....	
48,000	....	.022000	.001500	....	....	
49,000	....	.023625	.001625	....	....	
50,000	....	.025250	.001625	....	....	
51,000	....	.027125	.001875	....	....	
52,000	....	.029000	.001875	....	....	
53,000	....	.031125	.002125	....	....	
54,000	....	.033250	.002125	....	....	
55,000	....	.035625	.002375	....	....	
56,000	....	.038000	.002375	....	....	
57,000	....	.041125	.003125	....	....	
58,000	....	.043750	.002625	....	....	
59,000	....	.046875	.003125	....	....	
60,000	....	.051000	.004125	....	....	
61,000	....	.0575	.0065	....	....	
62,000	....	.0638	.0063	....	....	
64,000	....	.0750	.0112	....	....	
66,000	....	.0950	.0200	....	....	
67,860	89,520	.1513	.0563	....	....	Tensile strength.
61,000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1925.

Elongation of inch sections, ″.12, ″.14, ″.13, ″.24 (″.46 fractured section), ″.15, ″.17, ″.13.

Area at fracture 1″.20×″.39=.468 square inch.

Contraction of area, 38.3 per cent.

Appearance of fracture granular, radiating from a dull spongy center. Silky edges.

No. 500.

Marks on bar, 3637. .
Sectional area, 1″.504×″.502 = .755 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set. *	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
755	1,000	0.	0.	0.	0.	Initial load.
3,775	5,000	.000138	.000138			
7,550	10,000	.000263	.000125	0.		
11,325	15,000	.000450	.000187			
15,100	20,000	.000625	.000175			
18,875	25,000	.000775	.000150			
22,650	30,000	.000975	.000200			
26,425	35,000	.001150	.000175			
30,200	40,000	.001313	.000163	.000013	.000013	
31,000		.001363	.000050			
32,000		.001400	.000037			
33,000		.001450	.000050			
34,000		.001500	.000050			
35,000		.001550	.000050			
36,000		.001600	.000050			
37,000		.001638	.000038			
38,000	50,330	.001675	.000037			Elastic limit.
39,000		.008875	.007200			
40,000		.010625	.001750			
41,000		.011875	.001250			
42,000		.013000	.001125			
43,000		.014375	.001375			
44,000		.015625	.001250			
45,000		.016875	.001250			
46,000		.018250	.001375			
47,000		.019625	.001375			
48,000		.021125	.001500			
49,000		.022875	.001750			
50,000		.024500	.001625			
51,000		.026250	.001750			
52,000		.028250	.002000			
53,000		.030250	.002000			
54,000		.032375	.002125			
55,000		.034875	.002500			
56,000		.037250	.002375			
57,000		.040375	.003125			
58,000		.043125	.002750			
50,000		.046500	.003375			
60,000		.050250	.003750			
62,000		.0625	.012250			
64,000		.0750	.0125			
66,000		.0950	.0200			
67,490	89,390	.1475	.0525			Tensile strength.
60,600						Load at time of rupture.

Elongation per inch after rupture, ″.2088.

Elongation of inch sections, ″.11, ″.16, ″.21 (″.52 fractured section), ″.22, ″.21, ″.15, ″.09.

Area at fracture, 1″.19×″.38 = .452 square inch.

Contraction of area, 40.1 per cent.

Appearance of fracture silky, with trace of granulation, spongy center.

No. 501.

Marks on bar, 3637 . . .
Sectional area, 1''.500 × ''.503 = .754 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	
3,770	5,000	.000113	.000113			
7,540	10,000	.000263	.000150	0.		
11,310	15,000	.000425	.000162			
15,080	20,000	.000600	.000175			
18,850	25,000	.000750	.000150			
22,620	30,000	.000925	.000175			
26,390	35,000	.001100	.000175			
30,160	40,000	.001288	.000188	0.		
31,000		.001313	.000025			
32,000		.001375	.000062			
33,000		.001400	.000025			
34,000		.001463	.000063			
35,000		.001513	.000050			
36,000		.001575	.000062			
37,000		.001625	.000050			
38,000		.001663	.000038			
39,000		.001700	.000037			
40,000		.001763	.000063			
41,000	54,380	.001838	.000075			Elastic limit.
42,000		.014000	.002102			
43,000		.014750	.000750			
44,000		.016000	.001250			
45,000		.017125	.001125			
46,000		.018500	.001375			
47,000		.020125	.001625			
48,000		.021750	.001625			
49,000		.023250	.001500			
50,000		.024750	.001500			
51,000		.026625	.001875			
52,000		.028625	.002000			
53,000		.030625	.002000			
54,000		.032750	.002125			
55,000		.035000	.002250			
56,000		.037500	.002500			
57,000		.040500	.003000			
58,000		.043500	.003000			
59,000		.046750	.003250			
60,000		.050375	.003625			
62,000		.0638	.013425			
64,000		.0763	.0125			
66,000		.0975	.0212			
67,260	89,200	.1425	.0450			Tensile strength.
61,000						Load at time of rupture.

Elongation per inch after rupture, ''.1725.
Elongation of inch sections, ''.12, ''.14, .''13 (''.37 fractured section, ''.24,) ''.14, ''.13, ''.11.
Area at fracture, 1''.21 × ''.39 = .472 square inch.
Contraction of area, 37.4 per cent.
Appearance of fracture, fine granular center, silky edges.

No. 502.

Marks on bar, 3637 . . . .
Sectional area, 1″.500 × ″.504 = .756 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
756	1,000	0.	0.	0.	0.	Initial load.
3,780	5,000	.000050	.000050			
7,560	10,000	.000200	.000150	—.000038	—.000038	
11,340	15,000	.000363	.000163			
15,120	20,000	.000513	.000150			
18,900	25,000	.000663	.000150			
22,680	30,000	.000863	.000200			
26,460	35,000	.001013	.000150			
30,240	40,000	.001163	.000150	—.000025	.000013	
32,000		.001263	.000100			
33,000		.001325	.000062			
34,000		.001375	.000050			
35,000		.001425	.000050			
36,000		.001500	.000075			
36,900	48,810	.001575	.000075			Elastic limit.
37,000		.003338	.001763			
38,000		.004625	.001287			
39,000		.005375	.000750			
40,000		.007000	.001625			
41,000		.009875	.002875			
42,000		.011000	.001125			
43,000		.012250	.001250			
44,000		.013125	.000875			
45,000		.014875	.001750			
46,000		.015375	.000500			
47,000		.016750	.001375			
48,000		.018125	.001375			
49,000		.019375	.001250			
50,000		.020750	.001375			
51,000		.022375	.001625			
52,000		.023750	.001375			
53,000		.025375	.001625			
54,000		.027125	.001750			
55,000		.028875	.001750			
56,000		.030750	.001875			
57,000		.032750	.002000			
58,000		.035000	.002250			
59,000		.037375	.002375			
60,000		.040000	.002625			
62,000		.0475	.0075			
64,000		.0563	.0088			
66,000		.0675	.0112			
68,000		.0800	.0125			
70,000		.1125	.0325			
70,440	93,170	.1388	.0263			Tensile strength.
63,400						Load at time of rupture.

Elongation per inch after rupture, 0″.1800.
Elongation of inch sections (″.37 fractured section), ″.23, ″.13, ″.14, ″.10, ″.19, ″.17, ″.11.
Area at fracture, 1″.23 × ″.40 = .492 square inch.
Contraction of area, 34.9 per cent.
Appearance fine, granular, radiating from a dull, spongy center.

No. 421.

Compression Test.

Mark, 3487.
Length, 11″.990.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.21, ″.29.
Minimum bearing surface, .934 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	....	....	
10,000	10,000	.000260	.000150	0.	....	
15,000	15,000	.000420	.000160	....	....	
20,000	20,000	.000590	.000170	....	....	
25,000	25,000	.000740	.000150	....	....	
30,000	30,000	.000920	.000180	....	....	
35,000	35,000	.001070	.000150	....	....	
40,000	40,000	.001220	.000150	.000020	.000020	
41,000	41,000	.001300	.000080	....	....	
42,000	42,000	.001330	.000030	....	....	
43,000	43,000	.001360	.000030	....	....	
44,000	44,000	.001410	.000050	....	....	
45,000	45,000	.001430	.000020	....	....	
46,000	46,000	.001460	.000030	....	....	
47,000	47,000	.001510	.000050	....	....	
48,000	48,000	.001540	.000030	....	....	
49,000	49,000	.001580	.000040	....	....	
50,000	50,000	.001630	.000050	....	....	Elastic limit.
51,000	51,000	.001700	.000070	....	....	
52,000	52,000	.001800	.000100	....	....	
53,000	53,000	.001900	.000100	....	....	Decided deflection.
				Maximum deflection chord 10″.		
54,000	54,000	.004550	.002650	....	....	
55,000	55,000	.0080	.003450	....	....	
56,000	56,000	.0100	.0020	.07	....	
57,000	57,000	.0120	.0020	.09	....	
58,000	58,000	.0130	.0010	.10	....	
59,000	59,000	.0150	.0020	.11	....	
59,800	59,800	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	50,000
Compression per inch under stress at elastic limit	inch..	0.001630
Ultimate strength per square inch of original section	pounds..	59,800
Manner of failure		triple flexur

Bent through 160° without injury.

No. 422.

Compression Test.

Mark, 3637.
Length, 12″.00.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.31, ″.38.
Minimum bearing surface, .887 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	....	....	
10,000	10,000	.000270	.000150	0.	....	
15,000	15,000	.000430	.000160	....	....	
20,000	20,000	.000610	.000180	....	....	
25,000	25,000	.000770	.000160	....	....	
30,000	30,000	.000930	.000160	....	....	
35,000	35,000	.001100	.000170	....	....	
40,000	40,000	.001280	.000180	.000030	.000030	
41,000	41,000	.001310	.000030	....	....	
42,000	42,000	.001360	.000050	....	....	
43,000	43,000	.001410	.000050	....	....	
44,000	44,000	.001430	.000020	....	....	
45,000	45,000	.001470	.000040	....	....	
46,000	46,000	.001490	.000020	....	....	
				Maximum deflection. Chord 10″.		
47,000	47,000	.001530	.000040	....	....	
48,000	48,000	.001570	.000040	....	....	
49,000	49,000	.001590	.000020	....	....	
50,000	50,000	.001650 .005400	.000060 .003750	.... .11	....	Elastic limit.
51,000	51,000	.0080	.0026	.16	....	
52,000	52,000	.0100	.0020	.25	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	50,000
Compression per inch under stress at elastic limit	inch..	0.001650
Ultimate strength per square inch of original section	pounds..	52,000
Manner of failure		triple flexure

No. 423.

Compression Test.

Mark, 3637 . .
Length, 12″.00.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.34, ″.36.
Minimum bearing surface, .898 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000130	.000130			
10,000	10,000	.000300	.000170	0.		
15,000	15,000	.000470	.000170			
20,000	20,000	.000620	.000150			
25,000	25,000	.000780	.000160			
30,000	30,000	.000950	.000170			
35,000	35,000	.001100	.000150			
40,000	40,000	.001260	.000160	.000010	.000010	
41,000	41,000	.001290	.000030			
42,000	42,000	.001320	.000030			
43,000	43,000	.001340	.000020			
44,000	44,000	.001370	.000030			
45,000	45,000	.001400	.000030			
46,000	46,000	.001420	.000020			
47,000	47,000	.001480	.000060			
48,000	48,000	.001500	.000020			
49,000	49,000	.001520	.000020			
50,000	50,000	.001540	.000020			
50,500	50,500	.001560	.000020			Elastic limit.
				Maximum deflection. Chord 10″.		
50,800	50,800	.001610	.000050			
		.0080	.006390	.14		
51,000	51,000	.0090	.0010	.20		
52,000	52,000	.0100	.0010	.25		
52,500	52,500	.0120	.0020	.31		Ultimate strength.

General summary.

Elastic limit, per square inch of original section	pounds..	50,500
Compression per inch under stress at elastic limit	inch ...	0.001560
Ultimate strength per square inch of original section	pounds..	52,500
Manner of failure		triple flexure

STEEL SPECIMENS FROM THE SHAFT OF THE ATLANTA.

No. 503.

Marks on bar, 3639.
Sectional area, 1″.492 × ″.504 = .752 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
752	1,000	0.	0.	0.	0.	Initial load.
3,760	5,000	.000113	.000113	....	....	
7,520	10,000	.000263	.000150	0.	....	
11,280	15,000	.000413	.000150	....	....	
15,040	20,000	.000563	.000150	....	....	
18,800	25,000	.000775	.000212	....	....	
22,560	30,000	.000913	.000138	....	....	
26,320	35,000	.001063	.000150	....	....	
30,080	40,000	.001263	.000200	.000025	.000025	
31,000	....	.001300	.000037	....	....	
32,000	....	.001363	.000063	....	....	
33,000	....	.001400	.000037	....	....	
34,000	....	.001438	.000038	....	....	
35,000	46,540	.001488	.000050	....	....	Elastic limit.
36,000	....	.018688	.017200	....	....	
37,000	....	.019625	.000937	....	....	
38,000	....	.021325	.001700	....	....	
39,000	....	.023125	.001800	....	....	
40,000	....	.025125	.002000	....	....	
41,000	....	.027375	.002250	....	....	
42,000	....	.029875	.002500	....	....	
43,000	....	.032125	.002250	....	....	
44,000	....	.035000	.002875	....	....	
45,000	....	.038250	.003250	....	....	
46,000	....	.041750	.003500	....	....	
47,000	....	.045500	.003750	....	....	
48,000	....	.049750	.004250	....	....	
49,000	....	.054125	.004375	....	....	
50,000	....	.0650	.010875	....	....	
51,000	....	.0713	.0063	....	....	
52,000	....	.0788	.0075	....	....	
53,000	....	.0900	.0112	....	....	
54,000	....	.1038	.0138	....	....	
55,000	....	.1225	.0187	....	....	
55,590	73,920	.1738	.0513	....	....	Tensile strength.
50,800	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.245.
Elongation of inch sections, ″.14, ″.19, ″.21 (″.32 fractured section, ″.48,) ″.24, ″.21, ″.17.
Area at fracture, 1″.18 × ″.38 = .448 square inch.
Contraction of area, 40.4 per cent.
Appearance of fracture fine, silky.

No. 504.

Marks on bar, 3639 . .
Sectional area, 1''.500 × ''.505 = .757 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
757	1,000	0.	0.	0.	0.	Initial load.
3,785	5,000	.000100	.000100			
7,570	10,000	.000263	.000163	0.		
11,355	15,000	.000400	.000137			
15,140	20,000	.000600	.000200			
18,925	25,000	.000763	.000163			
22,710	30,000	.000925	.000162			
26,495	35,000	.001063	.000138			
30,280	40,000	.001263	.000200	0.		
31,000		.001288	.000025			
32,000		.001338	.000050			
33,000		.001388	.000050			
34,000		.001438	.000050			
35,000		.001488	.000050			
36,000	47,560	.001538	.000050			Elastic limit.
37,000		.015000	.013462			
38,000		.020125	.005125			
39,000		.020625	.000500			
40,000		.022125	.001500			
41,000		.024250	.002125			
42,000		.026500	.002250			
43,000		.028875	.002375			
44,000		.031750	.002875			
45,000		.034375	.002625			
46,000		.037500	.003125			
47,000		.041250	.003750			
48,000		.045500	.004250			
49,000		.050000	.004500			
50,000		.055000	.005000			
51,000		.0603	.0113			
52,000		.0713	.0050			
53,000		.0850	.0137			
54,000		.0975	.0125			
55,000		.1250	.0275			
55,820	73,740	.1725	.0475			Tensile strength.
49,000						Load at time of rupture.

Elongation per inch after rupture: 0''.2363.

Elongation of inch sections: ''.15, ''.19, ''.21, ''.24 (''.53 fractured section), ''.23, ''.17, ''.14.

Area at fracture, 1''.16 × ''.38 = .441 square inch.

Contraction of area, 41.7 per cent.

Appearance of fracture silky, with traces of granulation.

No. 505.

Marks on bar, 3639 . . .
Sectional area, 1″.503 × ″.498 = .748 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
748	1,000	0.	0.	0.	0.	Initial load.
3,740	5,000	.000138	.000138			
7,480	10,000	.000263	.000125	0.		
11,220	15,000	.000475	.000212			
14,960	20,000	.000613	.000138			
18,700	25,000	.000763	.000150			
22,440	30,000	.000963	.000200			
26,180	35,000	.001125	.000162			
29,920	40,000	.001288	.000163	.000013	.000013	
31,000		.001350	.000062			
32,000		.001388	.000038			
33,000		.001425	.000037			
34,000	45,450	.001488	.000063			Elastic limit.
35,000		.001600	.000112			
36,000		.016875	.005275			
37,000		.018375	.001500			
38,000		.021000	.002625			
39,000		.021375	.000375			
40,000		.023375	.002000			
41,000		.025500	.002125			
42,000		.027625	.002125			
43,000		.030000	.002375			
44,000		.032750	.002750			
45,000		.035625	.002875			
46,000		.038750	.003125			
47,000		.041875	.003125			
48,000		.045875	.004000			
49,000		.050000	.004175			
50,000		.055375	.005375			
51,000		.0638	.008425			
52,000		.0700	.0062			
53,000		.0800	.0100			
54,000		.0913	.0113			
55,000		.1063	.0150			
55,850	74,670	.1463	.0400			Tensile strength.
50,200						Load at time of rupture.

Elongation per inch after rupture, 0″.1975.

Elongation of inch sections, ″.09, ″.15, ″.34 (″.46 fractured section), ″.19, ″.11, ″.12, ″.12.

Area at fracture, 1″.16 × ″.38 = ″.441 square inch.

Contraction of area, 41 per cent.

Appearance of fracture silky, stratified.

No. 506.

Marks on bar, 3639 . . .
Sectional area, 1″.505 × ″.503 = .757 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
757	1, 000	0.	0.	0.	0.	Initial load.
3, 785	5, 000	.000088	.000088	....	....	
7, 570	10, 000	.000250	.000162	0.	....	
11, 355	15, 000	.000375	.000125	....	....	
15, 140	20, 000	.000538	.000163	....	....	
18, 925	25, 000	.000713	.000175	....	....	
22, 710	30, 000	.000875	.000162	....	....	
26, 495	35, 000	.001013	.000138	....	....	
30, 280	40, 000	.001225	.000212	0.	....	
31, 000	....	.001238	.000013	....	....	
32, 000	....	.001288	.000050	....	....	
33, 000	....	.001325	.000037	....	....	
34, 000	....	.001375	.000050	....	....	
35, 000	....	.001400	.000025	....	....	
36, 000	....	.001463	.000063	....	....	
37, 000	....	.001513	.000050	....	....	
38, 000	....	.001550	.000037	....	....	
38, 800	51, 250	.001575	.000025	....	....	Elastic limit.
39, 000	....	.005125	.003550	....	....	
40, 000	....	.018750	.013625	....	....	
41, 000	....	.023375	.004625	....	....	
42, 000	....	.023875	.000500	....	....	
43, 000	....	.025375	.001500	....	....	
44, 000	....	.027625	.002250	....	....	
45, 000	....	.030250	.002625	....	....	
46, 000	....	.032875	.002625	....	....	
47, 000	....	.035625	.002750	....	....	
48, 000	....	.039375	.003750	....	....	
49, 000	....	.042875	.003500	....	....	
50, 000	....	.047750	.004875	....	....	
51, 000	....	.0550	.007250	....	....	
52, 000	....	.0613	.0063	....	....	
53, 000	....	.0700	.0087	....	....	
54, 000	....	.0788	.0088	....	....	
55, 000	....	.0900	.0112	....	....	
56, 000	....	.1088	.0188	....	....	
56, 840	75, 090	.1463	.0375	....	....	Tensile strength.
51, 300	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.2050.

Elongation of inch sections, ″.12, ″.16 (″.44 fractured section), ″.27, ″.17, ″.17, ″.15, ″.16.

Area at fracture, 1″.21 × ″.39 = .472 square inch.

Contraction of area, 37.6 per cent.

Appearance of fracture silky, slightly granular. Irregular surface.

No. 507.

Marks on bar, 3641.
Sectional area, 1".504 × ".497 = .747 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
747	1,000	0.	0.	0.	0.	Initial load.
3,735	5,000	.000138	.000138	......	....	
7,470	10,000	.000263	.000125	.000013	.000013	
11,205	15,000	.000438	.000175	....	....	
14,940	20,000	.000613	.000175	....	....	
18,675	25,000	.000763	.000150	....	....	
22,410	30,000	.000938	.000175	....	....	
26,145	35,000	.001113	.000175	....	....	
29,880	40,000	.001275	.000162	.000013	0.	
31,000	....	.001338	.000063	....	....	
32,000	....	.001388	.000050	....	....	
33,000	....	.001425	000037	....	....	
34,000	....	.001488	000063	....	....	
35,000	....	.001525	.000037	....	....	
36,000	....	.001575	.000050	....	....	
37,000	....	.001638	.000063	....	....	
38,000	....	.001700	.000062	....	....	
39,000	....	.001750	.000050	....	....	
40,000	....	.001825	.000075	....	....	
40,600	54,350	.001863	.000038	....	....	Elastic limit.
41,000	....	.002500	.000637	....	....	
42,000	....	.003200	.000700	....	....	
43,000	....	.011763	.008563	....	....	
44,000	....	.012875	.001112	....	....	
45,000	....	.014375	.001500	....	....	
46,000	....	.015875	.001500	....	....	
47,000	....	.017500	.001625	....	....	
48,000	....	.019375	.001875	....	....	
49,000	....	.021125	.001750	....	....	
50,000	....	.023250	.002125	....	....	
51,000	....	.025375	.002125	....	....	
52,000	....	.027875	.002500	....	....	
53,000	....	.030500	.002625	....	....	
54,000	....	.033125	.002625	....	....	
55,000	....	.036250	.003125	....	....	
56,000	....	.040000	.003750	....	....	
57,000	....	.044375	.004375	....	....	
58,000	....	.048750	.004375	....	....	
59,000	....	.055000	.006250	....	....	
60,000	....	.0663	.0113	....	....	
61,000	....	.0763	.0100	....	....	
62,000	....	.0925	.0162	....	....	
62,900	84,200	.1350	.0425	....	....	Tensile strength.
53,200	....	....	....	....	....	Load at time of rupture

Elongation per inch after rupture, 0".1925.

Elongation of inch sections, ".12, ".16 (".52 fractured section), ".23, ".15, ".13, ".12, ".11.

Area at fracture, 1".16 × ".38 = .441 square inch.

Contraction of area, 41 per cent.

Appearance of fracture silky, slightly granular.

No. 508.

Marks on bar, 3641 . .
Sectional area, 1″.500 × ″.498 = .747 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
747	1,000	0.	0.	0.	0.	Initial load.
3,735	5,000	.000125	.000125			
7,470	10,000	.000275	.000150	0.		
11,205	15,000	.000425	.000150			
14,940	20,000	.000575	.000150			
18,675	25,000	.000750	.000175			
22,410	30,000	.000900	.000150			
26,145	35,000	.001088	.000188			
29,880	40,000	.001250	.000162	.000013	.000013	
31,000		.001300	.000050			
32,000		.001338	.000038			
33,000		.001400	.000062			
34,000		.001450	.000050			
35,000		.001488	.000038			
36,000		.001538	.000050			
37,000		.001588	.000050			
38,000		.001638	.000050			
39,000		.001688	.000050			
40,000		.001725	.000037			
41,000		.001763	.000038			
42,000		.001813	.000050			
43,000		.001850	.000037			
44,000	58,900	.001900	.000050			Elastic limit.
45,000		.008688	.006788			
46,000		.027400	.018712			
47,000		.027875	.000475			
48,000		.029000	.001125			
49,000		.031125	.002125			
50,000		.033500	.002375			
51,000		.036250	.002750			
52,000		.040000	.003750			
53,000		.043000	.003000			
54,000		.046250	.003250			
55,000		.050875	.004625			
56,000		.055125	.004250			
57,000		.0675	.012375			
58,000		.0775	.0100			
59,000		.0850	.0075			
60,000		.0975	.0125			
61,000		.1138	.0163			
61,940	82,920	.1638	.0500			Tensile strength.
55,500						Load at time of rupture.

Elongation per inch after rupture, 0″.2325.

Elongation of inch sections, ″.15, ″.17, ″.18, ″.21 (″.52 fractured section), ″.24, ″.22, ″.17.

Area at fracture, 1″.19 × ″.38 = .452 square inch.

Contraction of area, 39.5 per cent.

Appearance of fracture silky, slightly granular, fine lamination.

No. 509.

Marks on bar, 3641 . . .
Sectional area, 1″.444 × ″.495 = .715 square inch

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
715	1,000	0.	0.	0.	0.	**Initial load.**
3,575	5,000	.000125	.000125			
7,150	10,000	.000288	.000163	0.		
10,725	15,000	.000425	.000137			
14,300	20,000	.000600	.000175			
17,875	25,000	.000750	.000150			
21,450	30,000	.000925	.000175			
25,025	35,000	.001100	.000175			
28,600	40,000	.001275	.000175	.000013	.000013	
30,000		.001338	.000063			
31,000		.001388	.000050			
32,000		.001425	.000037			
33,000		.001475	.000050			
34,000		.001525	.000050			
35,000		.001588	.000063			
36,000	50,350	.001638	.000050			**Elastic limit.**
37,000		.001763	.000125			
37,500		.003000	.001237			
38,000		.005625	.002625			
39,000		.007500	.001875			
40,000		.009875	.002375			
41,000		.012500	.002625			
42,000		.014000	.001500			
43,000		.015625	.001625			
44,000		.017500	.001875			
45,000		.019250	.001750			
46,000		.021000	.001750			
47,000		.023125	.002125			
48,000		.025250	.002125			
49,000		.027500	.002250			
50,000		.030125	.002625			
51,000		.032750	.002625			
52,000		.036000	.003250			
53,000		.039625	.003625			
54,000		.043375	.003750			
55,000		.047500	.004125			
56,000		.053125	.005625			
57,000		.0625	.009375			
58,000		.0713	.0088			
59,000		.0813	.0100			
60,000		.0963	.0150			
60,800	85,030	.1425	.0462			**Tensile strength.**
53,800						**Load at time of rupture.**

Elongation per inch after rupture, 0″.2050.

Elongation of inch sections, ″.18, ″.19, ″.16, ″.15, ″.24 (″.49 fractured section), ″.13, ″.10.

Area at fracture, 1″.13 × ″.37 = .418 square inch.

Contraction of area, 41.5 per cent.

Appearance of fracture, spongy center, granular at either side.

No. 510.

Marks on bar, 3641 . . . .
Sectional area, 1″.500×″.500 = .750 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
750	1,000	0.	0.	0.	0.	Initial load.
3,750	5,000	.000113	.000113	....	....	
7,500	10,000	.000263	.000150	0.	....	
11,250	15,000	.000425	.000162	....	....	
15,000	20,000	.000600	.000175	....	....	
18,750	25,000	.000750	.000150	....	....	
22,500	30,000	.000900	.000150	....	....	
26,250	35,000	.001075	.000175	....	....	
30,000	40,000	.001250	.000175	.000038	.000038	
31,000	....	.001300	.000050	....	....	
32,000	....	.001350	.000050	....	....	
33,000	....	.001400	.000050	....	....	
34,000	....	.001463	.000063	....	....	
35,000	....	.001513	.000050	....	....	
36,000	48,000	.001575	.000062	....	....	Elastic limit.
37,000	....	.001675	.000100	....	....	
38,000	....	.008000	.006325	....	....	
39,000	....	.010500	.002500	....	....	
40,000	....	.011500	.001000	....	....	
41,000	....	.013125	.001625	....	....	
42,000	....	.014500	.001375	....	....	
43,000	....	.016000	.001500	....	....	
44,000	....	.017500	.001500	....	....	
45,000	....	.019250	.001750	....	....	
46,000	....	.020750	.001500	....	....	
47,000	....	.022875	.002125	....	....	
48,000	....	.024750	.001875	....	....	
49,000	....	.026875	.002125	....	....	
50,000	....	.029000	.002125	....	....	
51,000	....	.031375	.002375	....	....	
52,000	....	.034500	.003125	....	....	
53,000	....	.037500	.003000	....	....	
54,000	....	.040375	.002875	....	....	
55,000	....	.043875	.003500	....	....	
56,000	....	.048125	.004250	....	....	
57,000	....	.0563	.008175	....	....	
58,000	....	.0625	.0062	....	....	
59,000	....	.0688	.0063	....	....	
60,000	....	.0775	.0087	....	....	
61,000	....	.0875	.0100	....	....	
62,000	....	.1113	.0238	....	....	
62,660	83,550	.1500	.0387	....	....	Tensile strength.
55,000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.2325.

Elongation of inch sections, ″.16 (″.53 fractured section), ″.22, ″.15, ″.21, ″.17, ″.26, ″.16.

Area at fracture, 1″.15×″.36 = .414 square inch.

Contraction of area, 44.8 per cent.

Appearance of fracture, silky, with trace of granulation.

No. 424.

Compression Test.

Marks, 3639.
Length, 12''.00.
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Diameter of centers, ''.38, ''.40.
Minimum bearing surface, .874 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	....	....	
10,000	10,000	.000270	.000150	0.	....	
15,000	15,000	.000410	.000140	....	....	
20,000	20,000	.000580	.000170	....	....	
25,000	25,000	.000750	.000170	....	....	
30,000	30,000	.000910	.000160	....	....	
35,000	35,000	.001090	.000180	....	....	
40,000	40,000	.001270	.000180	.000020	.000020	
41,000	41,000	.001290	.000020	....	....	
42,000	42,000	.001320	.000030	....	....	
				Maximum deflection chord 10''.		
43,000	43,000	.001360 .004910	.000040 .003550	.... .02	....	Elastic limit.
44,000	44,000	.0080	.003090	.10	....	
45,000	45,000	.0110	.0030	.14	....	
45,700	45,700	.0170	.0060	.31	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	43,000
Compression per inch under stress at elastic limit	inch..	0.001360
Ultimate strength per square inch of original section	pounds..	45,700
Manner of failure		triple flexure

No. 425.

Compression Test.

Marks, 3639 . .
Length, 11''.996.
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Diameter of centers, ''.37, ''.37.
Minimum bearing surface, .892 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	....	....	
10,000	10,000	.000300	.000180	....	....	
15,000	15,000	.000460	.000160	....	....	
20,000	20,000	.000610	.000150	....	....	
25,000	25,000	.000800	.000190	....	....	
30,000	30,000	.000950	.000150	....	....	
35,000	35,000	.001130	.000180	.000010	.000010	
40,000	40,000	.001300	.000170	.000020	.000010	
41,000	41,000	.001320	.000020	....	....	
42,000	42,000	.001360	.000040	....	....	
43,000	43,000	.001400	.000040	....	....	
43,500	43,500	.001420	.000020	....	....	
44,000	44,000	.001450	.000030	....	....	
44,500	44,500	.001460	.000010	....	....	
45,000	45,000	.001480	.000020	....	....	
45,500	45,500	.001500	.000020	....	....	
46,000	46,000	.001510	.000010	....	....	
46,500	46,500	.001510	0.	....	....	
46,700	46,700	.001500	.000010	....	....	Elastic limit.
47,000	47,000	.001600	.000100	....	....	
47,500	47,500	.002260	.000660	....	....	
				Maximum deflection. Chord, 10''.		
48,000	48,000	.003460	.001200	.01	....	
49,000	49,000	.0070	.003540	.04	....	
49,300	49,300	....	....	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	46,700
Compression per inch under stress at elastic limit	inch..	0.001500
Ultimate strength per square inch of original section	pounds..	49,300
Manner of failure		triple flexure

No. 426.

Compression Test.

Marks, 3641.
Length, 11″.98.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.32, ″.33.
Minimum bearing surface, .914 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000140	.000140			
10,000	10,000	.000290	.000150	.000010	.000010	
15,000	15,000	.000470	.000180			
20,000	20,000	.000620	.000150			
25,000	25,000	.000780	.000160			
30,000	30,000	.000970	.000190			
35,000	35,000	.001110	.000140			
40,000	40,000	.001280	.000170	.000040	.000030	
41,000	41,000	.001320	.000040			
42,000	42,000	.001360	.000040			
43,000	43,000	.001400	.000040			
44,000	44,000	.001420	.000020			
45,000	45,000	.001460	.000040			Elastic limit.
46,000	46,000	.001520	.000060			
47,000	47,000	.001600	.000080	.000130	.000090	
48,000	48,000	.001680	.000080			
				Maximum deflection chord, 10″.		
48,500	48,500	.004970	.003290	.02		
49,000	49,000	.0080	.003030	.06		
50,000	50,000	.0100	.0020	.09		
51,000	51,000	.0120	.0020	.13		
52,000	52,000	.0140	.0020	.18		
52,800	52,800	.0160	.0020	.25		Ultimate strength.

General summary.

Elastic limit per square inch of original section .... pounds..	45,000
Compression per inch under stress at elastic limit .... inch..	0.001460
Ultimate strength per square inch of original section .... pounds..	52,800
Manner of failure	triple flexure

STEEL SPECIMENS FROM THE SHAFT OF THE CHICAGO.

No. 511.

Marks on bar, 3,656.
Sectional area, 1″.500×″.503 = .754 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	Initial load.
3,770	5,000	.000100	.000100	....	....	
7,540	10,000	.000250	.000150	0.	....	
11,310	15,000	.000413	.000163	....	....	
15,080	20,000	.000575	.000162	....	....	
18,850	25,000	.000738	.000163	....	....	
22,620	30,000	.000888	.000150	....	....	
26,390	35,000	.001063	.000175	....	....	
30,160	40,000	.001250	.000187	.0	....	
31,000	....	.001275	.000025	....	....	
32,000	....	.001313	.000038	....	....	
33,000	....	.001350	.000037	....	....	
34,000	....	.001400	.000050	....	....	
35,000	....	.001463	.000063	....	....	
36,000	....	.001513	.000050	....	....	
37,000	....	.001563	.000050	....	....	
38,000	....	.001613	.000050	....	....	
39,000	....	.001675	.000062	....	....	
40,000	53,040	.001775	.000100	....	....	Elastic limit.
40,500	....	.004750	.002975	....	....	
41,000	....	.005750	.001000	....	....	
42,000	....	.008375	.002625	....	....	
43,000	....	.009625	.001250	....	....	
44,000	....	.010125	.000500	....	....	
45,000	....	.012500	.002375	....	....	
46,000	....	.013625	.001125	....	....	
47,000	....	.014625	.001000	....	....	
48,000	....	.015750	.001125	....	....	
49,000	....	.017125	.001375	....	....	
50,000	....	.018375	.001250	....	....	
51,000	....	.019875	.001500	....	....	
52,000	....	.021250	.001375	....	....	
53,000	....	.022750	.001500	....	....	
54,000	....	.024375	.001625	....	....	
55,000	....	.025875	.001500	....	....	
56,000	....	.027750	.001875	....	....	
57,000	....	.029625	.001875	....	....	
58,000	....	.031625	.002000	....	....	
59,000	....	.033625	.002000	....	....	
60,000	....	.036250	.002625	....	....	
61,000	....	.038375	.002125	....	....	
62,000	....	.041375	.003000	....	....	
63,000	....	.044500	.003125	....	....	
64,000	....	.047250	.002750	....	....	
65,000	....	.051000	.003750	....	....	
66,000	....	.0563	.0053	....	....	
67,000	....	.0625	.0062	....	....	
68,000	....	.0688	.0063	....	....	
69,000	....	.0750	.0062	....	....	
70,000	....	.0850	.0100	....	....	
71,000	....	.1038	.0188	....	....	
71,040	94,220	.1163	.0125	....	....	Ultimate strength.
65,400	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1488.

Elongation of inch sections, ″.06, ″.06, ″.10, ″.18 (″.47 fractured section), ″.13, ″.09, ″.10.

Area at fracture, 1″.22×″.39 = .476 square inch.

Contraction of area, 36.9 per cent.

Appearance granular, radiating from spongy spot ¼″ from center, silky edges.

No. 512.

Marks on bar, 3656 . .
Sectional area, 1″.502 × ″.505 = .758 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
758	1,000	0.	0.	0.	0.	Initial load.
3,790	5,000	.000100	.000100	...	...	
7,580	10,000	.000250	.000150	0.	...	
11,370	15,000	.000413	.000163	...	...	
15,160	20,000	.000575	.000162	...	...	
18,950	25,000	.000738	.000163	...	...	
22,740	30,000	.000888	.000150	...	...	
26,530	35,000	.001050	.000162	...	...	
30,320	40,000	.001213	.000163	0.	...	
32,000	...	.001313	.000100	...	...	
33,000	...	.001350	.000037	...	...	
34,000	...	.001388	.000038	...	...	
35,000	...	.001438	.000050	...	...	
36,000	...	.001488	.000050	...	...	
37,000	...	.001525	.000037	...	...	
38,000	...	.001575	.000050	...	...	
39,000	...	.001625	.000050	...	...	
40,000	...	.001650	.000025	...	...	
41,000	...	.001700	.000050	...	...	
42,000	...	.001750	.000050	...	...	
43,000	...	.001800	.000050	...	...	
44,000	...	.001850	.000050	...	...	
45,000	59,370	.001938	.000088	...	...	Elastic limit.
46,000	...	.014875	.012937	...	...	
47,000	...	.015250	.000375	...	...	
48,000	...	.015875	.000625	...	...	
49,000	...	.017125	.001250	...	...	
50,000	...	.018500	.001375	...	...	
51,000	...	.019875	.001375	...	...	
52,000	...	.021250	.001375	...	...	
53,000	...	.022625	.001375	...	...	
54,000	...	.024125	.001500	...	...	
55,000	...	.025875	.001750	...	...	
56,000	...	.027625	.001750	...	...	
57,000	...	.029750	.002125	...	...	
58,000	...	.031500	.001750	...	...	
59,000	...	.033750	.002250	...	...	
60,000	...	.036000	.002250	...	...	
61,000	...	.038250	.002250	...	...	
62,000	...	.040875	.002625	...	...	
63,000	...	.044000	.003125	...	...	
64,000	...	.046875	.002875	...	...	
65,000	...	.0538	.006925	...	...	
66,000	...	.0575	.0037	...	...	
67,000	...	.0625	.0050	...	...	
68,000	...	.0688	.0063	...	...	
69,000	...	.0750	.0062	...	...	
70,000	...	.0863	.0113	...	...	
71,000	...	.1063	.0200	...	...	
71,170	93,890	.1175	.0112	...	...	Ultimate strength.
64,000	...	...	...	...	...	Load at time of rupture.

Elongation per inch after rupture, 0″.1513.

Elongation of inch sections, ″.12, ″.29 (″.33 fractured section), ″.12, ″.10, ″.09, ″.09, ″.07.

Area at fracture, 1″.19 × ″.38 = .452 square inch.

Contraction of area, 40.4 per cent.

Appearance of fracture silky, slightly granular.

No. 513.

Marks on bar, 3656 . . .
Sectional area, 1''.500 × ''.503 = .754 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	Initial load.
3,770	5,000	.000125	.000125			
7,540	10,000	.000275	.000150	0.		
11,310	15,000	.000425	.000150			
15,080	20,000	.000600	.000175			
18,850	25,000	.000763	.000163			
22,620	30,000	.000913	.000150			
26,390	35,000	.001088	.000175			
30,160	40,000	.001263	.000175	.000025	.000025	
31,000		.001300	.000037			
32,000		.001350	.000050			
33,000		.001400	.000050			
34,000		.001438	.000038			
35,000		.001488	.000050			
36,000		.001525	.000037			
37,000		.001575	.000050			
38,000		.001625	.000050			
39,000		.001675	.000050			
40,000		.001725	.000050			
41,000		.001775	.000050			
42,000		.001825	.000050			
42,800	56,760	.001850	.000025			Elastic limit.
43,000		.007250	.005400			
44,000		.010375	.003125			
45,000		.011875	.001500			
46,000		.012875	.001000			
47,000		.014000	.001125			
48,000		.015125	.001125			
49,000		.016275	.001250			
50,000		.017500	.001125			
51,000		.018875	.001375			
52,000		.020125	.001250			
53,000		.021625	.001500			
54,000		.023125	.001500			
55,000		.024750	.001625			
56,000		.026375	.001625			
57,000		.028125	.001750			
58,000		.029875	.001750			
59,000		.031875	.002000			
60,000		.033750	.001875			
61,000		.036250	.002500			
62,000		.038500	.002250			
63,000		.041250	.002750			
64,000		.043750	.002500			
65,000		.047125	.003375			
66,000		.050125	.003000			
67,000		.054125	.004000			
68,000		.0613	.007175			
69,000		.0675	.0062			
70,000		.0750	.0075			
71,000		.0838	.0088			
72,000		.0963	.0125			
72,400	96,020	.1138	.0175			Tensile strength.
65,600						Load at time of rupture.

Elongation per inch after rupture, ''.1438.

Elongation of inch sections, ''.08, ''.07, ''.10, ''.09, ''.18 (''.43 fractured section), ''.12, ''.08.

Area at fracture, 1''.21 × ''.38 = .460 square inch.

Contraction of area, 39.0 per cent.

Appearance silky, 40 per cent. granular radiating from spongy center.

No. 514.

Marks on bar, 3656 . . . .
Sectional area, 1''.504 × ''.503 = .756 square inch

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
756	1,000	0.	0.	0.	0.	Initial load.
3,780	5,000	.000125	.000125			
7,560	10,000	.000275	.000150	0.		
11,340	15,000	.000438	.000163			
15,120	20,000	.000600	.000162			
18,900	25,000	.000788	.000188			
22,680	30,000	.000925	.000137			
26,460	35,000	.001100	.000175			
30,240	40,000	.001275	.000175	.000025	.000025	
32,000		.001350	.000075			
33,000		.001425	.000075			
34,000		.001463	.000038			
35,000		.001500	.000037			
36,000		.001550	.000050			
37,000		.001588	.000038			
38,000		.001637	.000049			
39,000		.001688	.000051			
40,000		.001725	.000037			
41,000		.001775	.000050			
42,000		.001825	.000050			
43,000		.001863	.000038			
44,000		.001913	.000050			
45,000	59,520	.001988	.000075			Elastic limit.
46,000		.002113	.000125			
46,500		.010000	.007887			
47,000		.012375	.002337			
48,000		.013250	.000875			
49,000		.014625	.001375			
50,000		.015375	.000750			
51,000		.016750	.001375			
52,000		.017875	.001125			
53,000		.019375	.001500			
54,000		.020875	.001500			
55,000		.022375	.001500			
56,000		.023875	.001500			
57,000		.025500	.001625			
58,000		.027250	.001750			
59,000		.029125	.001875			
60,000		.031250	.002125			
61,000		.033125	.001875			
62,000		.035375	.002250			
63,000		.037875	.002500			
64,000		.040625	.002750			
65,000		.043500	.002875			
66,000		.046625	.003125			
67,000		.050000	.003375			
68,000		.0563	.0063			
69,000		.0625	.0062			
70,000		.0663	.0042			
71,000		.0763	.0100			
72,000		.0850	.0087			
73,000		.1013	.0163			
73,450	97,160	.1338	.0325			Tensile strength.
65,600						Load at time of rupture.

Elongation per inch after rupture, ''.1738.

Elongation of inch sections, ''.14, ''.10, ''.10, ''.12, ''.17 (''.50 fractured section), ''.17, ''.09.

Area at fracture, 1''.18 × ''.39 = .460 square inch.

Contraction, 39.1 per cent.

Appearance of fracture, silky edges, 40 per cent.; granular, 60 per cent.: radiating from a point ¼'' from edge.

No. 515.

Marks on bar, 3711.
Sectional area, 1″.500 × ″.505 = .757 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
757	1,000	0.	0.	0.	0.	Initial load.
3,785	5,000	.000100	.000100			
7,570	10,000	.000250	.000150	0.		
11,355	15,000	.000400	.000150			
15,140	20,000	.000588	.000188			
18,925	25,000	.000750	.000162			
22,710	30,000	.000888	.000138			
26,495	35,000	.001050	.000162			
30,280	40,000	.001238	.000188	0.		
32,000		.001313	.000075			
33,000		.001363	.000050			
34,000		.001413	.000050			
35,000		.001463	.000050			
36,000		.001513	.000050			
37,000		.001550	.000037			
38,000		.001600	.000050			
39,000	51,520	.001688	.000088			Elastic limit.
40,000		.005500	.003812			
41,000		.007625	.002125			
42,000		.009125	.001500			
43,000		.012875	.003750			
44,000		.015000	.002125			
45,000		.016250	.001250			
46,000		.017750	.001500			
47,000		.019625	.001875			
48,000		.021125	.001500			
49,000		.022875	.001750			
50,000		.024625	.001750			
51,000		.027125	.002500			
52,000		.029625	.002500			
53,000		.031750	.002125			
54,000		.034375	.002625			
55,000		.037625	.003250			
56,000		.040625	.003000			
57,000		.044250	.003625			
58,000		.047500	.003250			
59,000		.052750	.005250			
60,000		.0600	.007250			
61,000		.0688	.0088			
62,000		.0750	.0062			
63,000		.0863	.0113			
64,000		.1038	.0175			
64,800	84,940	.1275	.0237			Tensile strength.
56,200						Load at time of rupture.

Elongation per inch after rupture, ″.1713.

Elongation of inch sections, ″.06, ″.08, ″.09, (″.53 fractured section), ″.18, ″.15, ″.15, ″.13.

Area at fracture, 1″.15 × ″.37 = .426 square inch.

Contraction of area, 43.7 per cent.

Appearance of fracture silky.

No. 516.

Marks on bar, 3711 . .
Sectional area, 1″.502 × ″.502 = .754 square incl.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	Initial load.
3,770	5,000	.000088	.000088	....	....	
7,540	10,000	.000250	.000162	0.	....	
11,310	15,000	.000438	.000188	....	....	
15,080	20,000	.000563	.000125	....	....	
18,850	25,000	.000738	.000175	....	....	
22,620	30,000	.000913	.000175	....	....	
26,390	35,000	.001063	.000150	....	....	
30,160	40,000	.001250	.000187	.000025	.000025	
32,000	....	.001375	.000125	....	....	
33,000	43,770	.001463	.000088	....	....	Elastic limit.
34,000	....	.002063	.000600	....	....	
35,000	....	.003688	.001625	....	....	
36,000	....	.007125	.003437	....	....	
37,000	....	.009750	.002625	....	....	
38,000	....	.011500	.001750	....	....	
39,000	....	.012000	.000500	....	....	
40,000	....	.013000	.001000	....	....	
41,000	....	.014375	.001375	....	....	
42,000	....	.015750	.001375	....	....	
43,000	....	.017250	.001500	....	....	
44,000	....	.018750	.001500	....	....	
45,000	....	.020250	.001500	....	....	
46,000	....	.021875	.001625	....	....	
47,000	....	.023625	.001750	....	....	
48,000	....	.025375	.001750	....	....	
49,000	....	.027500	.002125	....	....	
50,000	....	.029375	.001875	....	....	
51,000	....	.031500	.002125	....	....	
52,000	....	.033875	.002375	....	....	
53,000	....	.036250	.002375	....	....	
54,000	....	.039000	.002750	....	....	
55,000	....	.041875	.002875	....	....	
56,000	....	.045625	.003750	....	....	
57,000	....	.049125	.003500	....	....	
58,000	....	.0563	.007175	....	....	
59,000	....	.0613	.0050	....	....	
60,000	....	.0688	.0075	....	....	
61,000	....	.0750	.0062	....	....	
62,000	....	.0825	.0075	....	....	
63,000	....	.0938	.0113	....	....	
64,000	....	.1138	.0200	....	....	
64,550	85,610	.1525	.0387	....	....	Tensile strength.
55,300	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.2238.

Elongation of inch sections, ″.13, ″.15, ″.16, ″.19 (″.31 fractured section, ″.53) ″.20, ″.12.

Area at fracture, 1″.12 × ″.37 = .414 square inch.

Contraction of area, 45.1 per cent.

Appearance of fracture silky.

No. 517.

Marks on bar, 3711 . . .
Sectional area, 1″.501×″.502=.753 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
753	1,000	0.	0.	0.	0.	Initial load.
3,765	5,000	.000100	.000100			
7,530	10,000	.000275	.000175	0.		
11,295	15,000	.000438	.000163			
15,060	20,000	.000600	.000162			
18,825	25,000	.000738	.000138			
22,590	30,000	.000913	.000175			
26,355	35,000	.001100	.000187			
30,120	40,000	.001263	.000163	0.		
32,000		.001363	.000100			
33,000		.001413	.000050			
34,000		.001475	.000062			
35,000		.001500	.000025			
36,000		.001538	.000038			
37,000		.001588	.000050			
38,000		.001613	.000025			
39,000		.001663	.000050			
40,000	53,120	.001738	.000075			Elastic limit.
		.016000	.014262			
41,000		.016375	.000375			
42,000		.017125	.000750			
43,000		.018875	.001750			
44,000		.020375	.001500			
45,000		.022125	.001750			
46,000		.023500	.001375			
47,000		.025250	.001750			
48,000		.027375	.002125			
49,000		.029375	.002000			
50,000		.031250	.001875			
51,000		.034000	.002750			
52,000		.036500	.002500			
53,000		.039500	.003000			
54,000		.043000	.003500			
55,000		.046375	.003375			
56,000		.0525	.006125			
57,000		.0575	.0050			
58,000		.0600	.0025			
59,000		.0675	.0075			
60,000		.0738	.0063			
61,000		.0813	.0075			
62,000		.0925	.0112			
63,000		.1100	.0175			
63,780	84,700	.1350	.0250			Tensile strength.
56,200						Load at time of rupture.

Elongation per inch after rupture, 0″.2200.

Elongation of inch sections, ″.12, ″.19 (″.57 fractured section), ″.25, ″.18, ″.17, ″.16, ″.12.

Area at fracture, 1″.14×″.36 = .410 square inch.

Constraction of area, 45.6 per cent.

Appearance of fracture fine, silky.

No. 518.

Marks on bar, 3711. . . .
Sectional area, 1″.503 × ″.503 = .756 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
756	1,000	0.	0.	0.	0.	Initial load.
3,780	5,000	.000100	.000100			
7,560	10,000	.000238	.000138			
11,340	15,000	.000400	.000162			
15,120	20,000	.000563	.000163			
18,900	25,000	.000725	.000162			
22,680	30,000	.000888	.000163			
26,460	35,000	.001063	.000175			
30,240	40,000	.001225	.000162	0.		
31,000		.001250	.000025			
32,000		.001300	.000050			
33,000		.001350	.000050			
34,000		.001400	.000050			
35,000		.001450	.000050			
36,000		.001500	.000050			
37,000		.001525	.000025			
38,000		.001575	.000050			
39,000		.001613	.000038			
40,000		.001650	.000037			
41,000		.001713	.000063			
42,000		.001775	.000062			
43,000		.001825	.000050			
43,600	57,670	.001863	.000038			Elastic limit.
43,800		.008750	.006887			
44,000		.010350	.001600			
45,000		.016938	.006588			
46,000		.018100	.001162			
47,000		.019325	.001225			
48,000		.020913	.001588			
49,000		.022650	.001737			
50,000		.024338	.001688			
51,000		.026375	.002037			
52,000		.028475	.002100			
53,000		.030750	.002275			
54,000		.033138	.002388			
55,000		.035875	.002737			
56,000		.038563	.002688			
57,000		.041963	.003400			
58,000		.045438	.003475			
59,000		.049900	.004462			
60,000		.053750	.003850			
61,000		.0588	.005050			
62,000		.0663	.0075			
63,000		.0763	.0100			
64,000		.0850	.0087			
65,000		.0950	.0100			
66,000		.1288	.0338			
66,110	87,450	.1475	.0187			Tensile strength.
57,000						Load at time of rupture.

Elongation per inch after rupture, 0″.2063.

Elongation of inch sections, ″.11, ″.13, ″.15, ″.15, ″.20 (″.57 fractured section), ″.20, ″.14.

Area at fracture, 1″.15 × ″.35 = .403 square inch.

Contraction of area, 46.7 per cent.

Appearance of fracture fine, silky.

No. 519.

Marks on bar, 3730.
Sectional area, 1″.500 × ″.504 = .756 square inch.

Applied loads.		Elongation per inch.	Successive Elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
756	1, 000	0.	0.	0.	0.	Initial load.
3, 780	5, 000	.000113	.000113	....	....	
7, 560	10, 000	.000288	.000175	0.	....	
11, 340	15, 000	.000450	.000162	....	....	
15, 120	20, 000	.000625	.000175	....	....	
18, 900	25, 000	.000788	.000163	....	....	
22, 680	30, 000	.000950	.000162	....	....	
26, 460	35, 000	.001125	.000175	....	....	
30, 240	40, 000	.001288	.000163	.000038	.000038	
32, 000	....	.001388	.000100	....	....	
33, 000	....	.001450	.000062	....	....	
34, 000	....	.001475	.000025	....	....	
35, 000	....	.001513	.000038	....	....	
36, 000	....	.001563	.000050	....	....	
37, 000	....	.001600	.000037	....	....	
38, 000	....	.001638	.000038	....	....	
39, 000	....	.001700	.000062	....	....	
40, 000	....	.001763	.000063	....	....	
41, 000	....	.001788	.000025	....	....	
42, 000	....	.001838	.000050	....	....	
43, 000	....	.001875	.000037	....	....	
44, 000	....	.001925	.000050	....	....	
45, 000	....	.001963	.000038	....	....	
46, 000	....	.002013	.000050	....	....	
46, 700	61, 770	.002063	.000050	....	....	Elastic limit.
46, 800	....	.002638	.000575	....	....	
47, 000	....	.004025	.001387	....	....	
48, 000	....	.006625	.002600	....	....	
49, 000	....	.009975	.003350	....	....	
50, 000	....	.010588	.000613	....	....	
51, 000	....	.011250	.000662	....	....	
52, 000	....	.012163	.000913	....	....	
53, 000	....	.013150	.000987	....	....	
54, 000	....	.014125	.000975	....	....	
55,.000	....	.015250	.001125	....	....	
56, 000	....	.016275	.001025	....	....	
57, 000	....	.017363	.001088	....	....	
58, 000	....	.018525	.001162	....	....	
59, 000	....	.019663	.001138	....	....	
60, 000	....	.020850	.001187	....	....	
61, 000	....	.022000	.001150	....	....	
62, 000	....	.023525	.001525	....	....	
63, 000	....	.024750	.001225	....	....	
64, 000	....	.026250	.001500	....	....	
65, 000	....	.027813	.001563	....	....	
66, 000	....	.029375	.001562	....	....	
67, 000	....	.031225	.001850	....	....	
68, 000	....	.032900	.001675	....	....	
69, 000	....	.034625	.001725	....	....	
70, 000	....	.036688	.002063	....	....	
71, 000	....	.039125	.002437	....	....	
72, 000	....	.041375	.002250	....	....	
73, 000	....	.043900	.002525	....	....	
74, 000	....	.046750	.002850	....	....	
75, 000	....	.050125	.003375	....	....	
76, 000	....	.0575	.007375	....	....	
77, 000	....	.0613	.0038	....	....	
78, 000	....	.0675	.0062	....	....	
79, 000	....	.0725	.0050	....	....	
80, 000	....	.0838	.0113	....	....	
81, 000	107, 140	.1138 .1288	.0300 .0150	....	....	Tensile strength.
68, 860	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1763.

Elongation of inch sections, ″.11, ″.13, ″.14, ″.13, ″.13, ″.20 (″.47 fractured section), ″10.

Area at fracture, 1″.17 × ″.37 = 433 square inch.

Contraction of area, 42.7 per cent.

Appearance of fracture, silky edges, spongy center, granular at either side.

No. 520.

Marks on bar, 3730 . .
Sectional area, 1″.500 × ″.505 = ″.758 square inch.

Applied load.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
758	1, 000	0.	0.	0.	0.	Initial load.
3, 790	5, 000	.000100	.000100	....	....	
7, 580	10, 000	.000250	.000150	0.	....	
11, 370	15, 000	.000413	.000163	....	....	
15, 160	20, 000	.000613	.000200	....	....	
18, 950	25, 000	.000775	.000162	....	....	
22, 740	30, 000	.000925	.000150	....	....	
26, 530	35, 000	.001100	.000175	....	....	
30, 320	40, 000	.001288	.000188	0.	....	
31, 000	....	.001313	000025	....	....	
32, 000	....	.001350	.000037	....	....	
33, 000	....	.001413	.000063	....	....	
34, 000	....	.001450	.000037	....	....	
35, 000	....	.001488	.000038	....	....	
36, 000	....	.001538	.000050	....	....	
37, 000	....	.001587	.000049	....	....	
38, 000	....	.001625	.000038	....	....	
39, 000	....	.001663	.000038	....	....	
40, 000	....	.001725	.000062	....	....	
41, 000	....	.001775	.000050	....	....	
42, 000	....	.001813	.000038	....	....	
43, 000	....	.001863	.000050	....	....	
44, 000	....	.001913	.000050	....	....	
45, 000	....	.001963	.000050	....	....	
46, 000	....	.002025	.000062	....	....	
47, 000	62, 010	.002075	.000050	....	....	Elastic limit.
48, 000	....	.002275	.000200	....	....	
48, 500	....	{ .002413 .004475	.000138 .002062	....	....	
49, 000	....	.007100	.002625	....	....	
50, 000	....	.008388	.001288	....	....	
51, 000	....	.009625	.001237	....	....	
52, 000	....	.010725	.001100	....	....	
53, 000	....	.011750	.001025	....	....	
54, 000	....	.012775	.001025	....	....	
55, 000	....	.013813	.001038	....	....	
56, 000	....	.014913	.001100	....	....	
57, 000	....	.016013	.001100	....	....	
58, 000	....	.017125	.001112	....	....	
59, 000	....	.018313	.001188	....	....	
60, 000	....	.019750	.001437	....	....	
61, 000	....	.021063	.001313	....	....	
62, 000	....	.022175	.001112	....	....	
63, 000	....	.023450	.001275	....	....	
64, 000	....	.024775	.001325	....	....	
65, 000	....	.026188	.001413	....	....	
66, 000	....	.027788	.001600	....	....	
67, 000	....	.029250	.001462	....	....	
68, 000	....	.030813	.001563	....	....	
69, 000	....	.032625	.001812	....	....	
70, 000	....	.034750	.002125	....	....	
71, 000	....	.036633	.001883	....	....	
72, 000	....	.038750	.002117	....	....	
73, 000	....	.041375	.002625	....	....	
74, 000	....	.044250	.002875	....	....	
75, 000	....	.046913	.002663	....	....	
76, 000	....	.050150	.003237	....	....	
77, 000	....	.0550	.004850	....	....	
78, 000	....	.0600	.0050	....	....	
79, 000	....	.0650	.0050	....	....	
80, 000	....	.0738	.0088	....	....	
81, 000	....	.0850	.0112	....	....	
81, 750	107, 850	.1075	.0225	....	....	Tensile strength.
69, 000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture 0″.1600.

Elongation of inch sections, ″.07, ″.11, ″.18 (″.48 fractured section), ″.13, ″.11, ″.11, ″.09.

Area at fracture, ″1.18 × ″.36 = .425 square inch.

Contraction of area, 43.9 per cent.

Appearance of fracture silky, slightly granular.

No. 521.

Marks on bar, 3737 . . .
Sectional area, 1″.502 × ″.502 = .754 square inch

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	Initial load.
3,770	5,000	.000138	.000138	....	....	
7,540	10,000	.000288	.000150	.000013	.000013	
11,310	15,000	.000450	.000162	....	....	
15,080	20,000	.000600	.000150	....	....	
18,850	25,000	.000775	.000175	....	....	
22,620	30,000	.000950	.000175	....	....	
26,390	35,000	.001125	.000175	....	....	
30,160	40,000	.001275	.000150	.000038	.000025	
32,000	....	.001388	.000113	....	....	
33,000	....	.001438	.000050	....	....	
34,000	....	.001475	.000037	....	....	
35,000	....	.001525	.000050	....	....	
36,000	....	.001563	.000038	....	....	
37,000	....	.001600	.000037	....	....	
38,000	....	.001650	.000050	....	....	
39,000	....	.001713	.000063	....	....	
40,000	....	001763	.000050	....	....	
41,000	....	.001800	.000037	....	....	
42,000	....	.001850	.000050	....	....	
43,000	....	.001888	.000038	....	....	
44,000	....	.001950	.000062	....	....	
45,000	....	.002000	.000050	....	....	
46,000	....	.002038	.000038	....	....	
47,000	....	.002088	.000050	....	....	
48,000	....	.002125	.000037	....	....	
49,000	64,990	.002163 .010375	.000038 .008212	....	....	Elastic limit.
50,000	....	.011025	.000650	....	....	
51,000	....	.012000	.000975	....	....	
52,000	....	.013025	.001025	....	....	
53,000	....	.014013	.000988	....	....	
54,000	....	.016100	.002087	....	....	
55,000	....	.016500	.000400	....	....	
56,000	....	.017475	.000975	....	....	
57,000	....	.018688	.001213	....	....	
58,000	....	.019950	.001262	....	....	
59,000	....	.021125	.001175	....	....	
60,000	....	.022500	.001375	....	....	
61,000	....	.023875	.001375	....	....	
62,000	....	.025350	.001475	....	....	
63,000	....	.026875	.001525	....	....	
64,000	....	.028625	.001750	....	....	
65,000	....	.030188	.001563	....	....	
66,000	....	.031975	.001787	....	....	
67,000	....	.033938	.001963	....	....	
68,000	....	.035875	.001937	....	....	
69,000	....	.038150	.002275	....	....	
70,000	....	.040500	.002350	....	....	
71,000	....	.043375	.002875	....	....	
72,000	....	.045913	.002538	....	....	
73,000	....	.049063	.003150	....	....	
74,000	....	.052500	.003437	....	....	
75,000	....	.0588	.0063	....	....	
76,000	....	.0638	.0050	....	....	
77,000	....	.0700	.0062	....	....	
78,000	....	.0763	.0063	....	....	
79,000	....	.0913	.0150	....	....	
79,900	105,970	.1100	.0087	....	....	Tensile strength.
68,200	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1950.

Elongation of inch sections, ″.12, ″.18, ″.16, ″.11, ″.12, ″.25 (″.48 fractured section), ″.14.

Area at fracture, 1.″18 × ″.37 = .437 square inch.

Contraction of area, 42 per cent.

Appearance of fracture silky, slightly granular.

No. 522.

Marks on bar, 3730 . . . .
Sectional area, 1''.502×''.497=.746 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
746	1,000	0.	0.	0.	0.	Initial load.
3,730	5,000	.000125	.000125			
7,460	10,000	.000275	.000150	0.		
11,190	15,000	.000450	.000175			
14,920	20,000	.000588	.000138			
18,650	25,000	.000775	.000187			
22,380	30,000	.000925	.000150			
26,110	35,000	.001100	.000175			
29,840	40,000	.001263	.000163	.000013	.000013	
31,000		.001338	.000075			
32,000		.001363	.000025			
33,000		.001413	.000050			
34,000		.001475	.000062			
35,000		.001538	.000063			
36,000		.001563	.000025			
37,000		.001613	.000050			
38,000		.001663	.000050			
39,000		.001713	.000050			
40,000		.001775	.000062			
41,000		.001800	.000025			
42,000		.001850	.000050			
43,000		.001875	.000025			
44,000		.001938	.000063			
45,000		.001975	.000037			
46,000		.002025	.000050			
47,000		.002088	.000063			
48,000	64,340	.002150	.000062			Elastic limit.
49,000		.002375 .005225	.000225 .002850			
50,000		.006188	.000963			
51,000		.007538	.001350			
52,000		.009000	.001462			
53,000		.010063	.001063			
54,000		.011200	.001137			
55,000		.012250	.001050			
56,000		.013313	.001063			
57,000		.014400	.001087			
58,000		.015600	.001200			
59,000		.016750	.001150			
60,000		.018125	.001375			
61,000		.019313	.001188			
62,000		.020375	.001062			
63,000		.021788	.001413			
64,000		.022875	.001087			
65,000		.024375	.001500			
66,000		.025875	.001500			
67,000		.027288	.001413			
68,000		.028900	.001612			
69,000		.030500	.001600			
70,000		.032413	.001913			
71,000		.034250	.001837			
72,000		.036400	.002150			
73,000		.038875	.002475			
74,000		.041438	.002563			
75,000		.044275	.002837			
76,000		.047313	.003038			
77,000		.050938	.003625			
78,000		.0575	.006562			
79,000		.0613	.0038			
80,000		.0675	.0062			
81,000		.0763	.0088			
82,000		.0975	.0212			
82,060	110,000	.1100	.0125			Tensile strength.
68,600						Load at time of rupture.

Elongation per inch after rupture, 0''.1613.
Elongation of inch sections, ''.07, ''.09, ''.11, ''.12, ''.13, ''15, (''.50 fractured section), ''.12.
Area at fracture, 1''.18 × ''.37 = .437 square inch.
Contraction of area 41.4 per cent.
Appearance of fracture silky, slightly granular.

No. 523.

Marks on bar, 3741.
Sectional area, 1''.500 × ''.500 = .750 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
750	1, 000	0.	0.	0.	0.	Initial load.
3, 750	5, 000	.000100	.000100			
7, 500	10, 000	.000203	.000163	0.		
11, 250	15, 000	.000425	.000162			
15, 000	20, 000	.000588	.000163			
18, 750	25, 000	.000763	.000175			
22, 500	30, 000	.000925	.000162			
26, 250	35, 000	.001100	.000175			
30, 000	40, 000	.001275	.000175	.000025	.000025	
31, 000		.001325	.000050			
32, 000		.001375	.000050			
33, 000		.001438	.000063			
34, 000		.001500	.000062			
35, 000		.001525	.000025			
36, 000		.001563	.000038			
37, 000		.001625	.000062			
38, 000		.001675	.000050			
39, 000		.001738	.000063			
40, 000		.001763	.000025			
41, 000	54, 670	.001813	.000050			Elastic limit.
41, 100		.002875	.001062			
41, 500		.003150	.002250			
42, 000		.010625	.005475			
43, 000		.015250	.004625			
44, 000		.016225	.000975			
45, 000		.017625	.001400			
46, 000		.019150	.001525			
47, 000		.020600	.001450			
48, 000		.022475	.001875			
49, 000		.024125	.001650			
50, 000		.026188	.002063			
51, 000		.028000	.001812			
52, 000		030313	.002313			
53, 000		.032625	.002312			
54, 000		.035150	.002525			
55, 000		.037625	.002475			
56, 000		.040625	.003000			
57, 000		.043900	.003275			
58, 000		.047375	.003475			
59, 000		.051563	.004188			
60, 000		.0588	.007237			
61, 000		.0650	.0062			
62, 000		.0700	.0050			
63, 000		.0788	.0088			
64, 000		.0888	.0100			
65, 000		.1075	.0187			
65, 960	87, 950	.1475	.0400			Tensile strength.
55, 000						Load at time of rupture.

Elongation per inch after rupture, 0''.2163.

Elongation of inch sections, ''.16, ''.17, ''.18 (''.44 fractured section ''.37), ''.15, ''.13, ''.13.

Area at fracture, 1''.10 × ''.34 = .374 square inch.

Contraction of area, 50.1 per cent.

Appearance of fracture fine, silky.

No. 524.

Marks on bar, 3741 . .
Sectional area, 1″.500×″.497=.745 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
745	1,000	0.	0.	0.	0.	Initial load.
3,725	5,000	.000100	.000100			
7,450	10,000	.000263	.000163	0.		
11,175	15,000	.000425	.000162			
14,900	20,000	.000588	.000163			
18,625	25,000	.000763	.000175			
22,350	30,000	.000950	.000187			
26,075	35,000	.001088	.000138			
29,800	40,000	.001263	.000175	0.		
31,000		.001338	.000075			
32,000		.001363	.000025			
33,000		.001425	.000062			
34,000		.001463	.000038			
35,000		.001513	.000050			
36,000		.001563	.000050			
37,000		.001600	.000037			
38,000		.001650	.000050			
39,000		.001713	.000063			
40,000		.001763	.000050			
41,000		.001800	.000037			
42,000		.001850	.000050			
43,000		.001900	.000050			
44,000		.001950	.000050			
45,000	60,400	.002000	.000050			Elastic limit.
45,500		.002088 .008500	.000088 .006412			
46,000		.009750	.001250			
47,000		.010538	.000788			
48,000		.012550	.002012			
49,000		.015813	.003263			
50,000		.017750	.001937			
51,000		.019588	.001838			
52,000		.021600	.002012			
53,000		.023525	.001925			
54,000		.024600	.001075			
55,000		.028375	.003775			
56,000		.030813	.002438			
57,000		.034100	.003287			
58,000		.037475	.003375			
59,000		.040500	.003025			
60,000		.044538	.004038			
61,000		.0525	.007962			
62,000		.0563	.0032			
63,000		.0638	.0075			
64,000		.0713	.0075			
65,000		.0838	.0125			
66,000		.1075	.0237			
66,200	88,860	.1288	.0213			Tensile strength.
55,800						Load at time of rupture.

Elongation per inch after rupture, 0″.1825.

Elongation of inch sections, ″.08, ″.10, ″.10, ″.12, ″.14, ″.16 (″.56 fractured section), ″.20.

Area at fracture, 1″.12×″.36 = .403 square inch.

Contraction of area, 45.9 per cent.

Appearance of fracture fine, silky.

No. 525.

Marks on bar, 3741 . .
Sectional area, 1″.502 × ″.496 = .745 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
745	1,000	0.	0.	0.	0.	Initial load.
3,725	5,000	.000113	.000113	....	....	
7,450	10,000	.000275	.000162	....	....	
11,175	15,000	.000425	.000150	....	....	
14,900	20,000	.000600	.000175	....	....	
18,625	25,000	.000763	.000163	....	....	
22,350	30,000	.000925	.000162	....	....	
26,075	35,000	.001100	.000175	....	....	
29,800	40,000	.001275	.000175	.000013	.000013	
31,000	....	.001350	.000075	....	....	
32,000	....	.001400	.000050	....	....	
33,000	....	.001425	.000025	....	....	
34,000	....	.001475	.000050	....	....	
35,000	....	.001525	.000050	....	....	
36,000	....	.001563	.000038	....	....	
37,000	....	.001613	.000050	....	....	
37,800	50,740	.001650	.000037	....	....	Elastic limit.
38,000	....	{ .001850 .005688	.000200 .003838	....	....	
39,000	....	.010375	.004687	....	....	
40,000	....	.011575	.001200	....	....	
41,000	....	.012850	.001275	....	....	
42,000	....	.014250	.001400	....	....	
43,000	....	.015525	.001275	....	....	
44,000	....	.017063	.001538	....	....	
45,000	....	.018613	.001550	....	....	
46,000	....	.020188	.001575	....	....	
47,000	....	.021888	.001700	....	....	
48,000	....	.023588	.001700	....	....	
49,000	....	.025400	.001812	....	....	
50,000	....	.027500	.002100	....	....	
51,000	....	.029500	.002000	....	....	
52,000	....	.031688	.002188	....	....	
53,000	....	.034200	.002512	....	....	
54,000	....	.036788	.002588	....	....	
55,000	....	.039538	.002750	....	....	
56,000	....	.042825	.003287	....	....	
57,000	....	.046250	.003425	....	....	
58,000	....	.050125	.003875	....	....	
59,000	....	.0550	.004875	....	....	
60,000	....	.0613	.0063	....	....	
61,000	....	.0675	.0062	....	....	
62,000	....	.0750	.0075	....	....	
63,000	....	.0850	.0100	....	....	
64,000	....	.0963	.0113	....	....	
65,000	....	.1250	.0287	....	....	
65,100	87,380	.1425	.0175	....	....	Tensile strength.
54,300	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.2088.

Elongation of inch sections, ″.12, ″.16, ″.16, ″.13, ″.16 (″.61 fractured section), ″.22, ″.11.

Area at fracture, 1″.12 × ″.36 = .403 square inch.

Contraction of area, 45.9 per cent.

Appearance of fracture silky.

No. 526.

Marks on bar, 3741 . . . .
Sectional area, 1″.502 × ″.498 = .748 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
748	1,000	0.	0.	0.	0.	Initial load.
3,740	5,000	.000100	.000100	...	...	
7,480	10,000	.000250	.000150	0.	...	
11,220	15,000	.000413	.000163	...	...	
14,960	20,000	.000575	.000162	...	...	
18,700	25,000	.000738	.000163	...	...	
22,440	30,000	.000913	.000175	...	...	
26,180	35,000	.001063	.000150	...	...	
29,920	40,000	.001238	.000175	0.	...	
31,000	...	.001288	.000050	...	...	
32,000	...	.001338	.000050	...	...	
33,000	...	.001375	.000037	...	...	
34,000	...	.001425	.000050	...	...	
35,000	...	.001475	.000050	...	...	
36,000	...	.001538	.000063	...	...	
37,000	...	.001575	.000037	...	...	
38,000	...	.001613	.000038	...	...	
39,000	...	.001663	.000050	...	...	
40,000	...	.001700	.000037	...	...	
41,000	...	.001738	.000038	...	...	
42,000	...	.001788	.000050	...	...	
43,000	...	.001863	.000075	...	...	
44,000	...	.001913	.000050	...	...	
45,000	60,160	.001988	.000075	...	...	Elastic limit.
45,300	...	.002138	.000150	...	...	
		.002838	.000700	...	...	
46,000	...	.003163	.000325	...	...	
47,000	...	.004125	.000962	...	...	
48,000	...	.010625	.006500	...	...	
49,000	...	.012875	.002250	...	...	
50,000	...	.014250	.001375	...	...	
51,000	...	.015938	.001688	...	...	
52,000	...	.017788	.001850	...	...	
53,000	...	.020000	.002212	...	...	
54,000	...	.021588	.001588	...	...	
55,000	...	.024300	.002712	...	...	
56,000	...	.026875	.002575	...	...	
57,000	...	.029750	.002875	...	...	
58,000	...	.033000	.003250	...	...	
59,000	...	.036250	.003250	...	...	
60,000	...	.040438	.004188	...	...	
61,000	...	.045000	.004562	...	...	
62,000	...	.050513	.005513	...	...	
63,000	...	.0575	.006987	...	...	
64,000	...	.0700	.0125	...	...	
65,000	...	.0850	.0150	...	...	
65,710	87,850	.1188	.0338	...	...	Tensile strength.
57,000	...	...	...	...	...	Load at time of rupture.

Elongation per inch after rupture, 0″.1813.

Elongation of inch sections, ″.12 (″.52 fractured sections), ″.15, ″.15, ″.14, ″.14, ″.14, ″.09.

Area at fracture, 1″.15 × ″.36 = ″.414 square inch.

Contraction of area, 44.6 per cent.

Appearance fine, silky.

No. 527.

Marks on bar, 3753.
Sectional area, 1″.503 × ″.504 = .757 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
757	1,000	0.	0.	0.	0.	Initial load.
3,785	5,000	.000125	.000125	...	...	
7,570	10,000	.000288	.000163	0.	...	
11,355	15,000	.000450	.000162	...	...	
15,140	20,000	.000613	.000163	...	...	
18,925	25,000	.000775	.000162	...	...	
22,710	30,000	.000950	.000175	...	...	
26,495	35,000	.001100	.000150	...	...	
30,280	40,000	.001275	.000175	.000038	.000038	
31,000	...	.001325	.000050	...	...	
32,000	...	.001363	.000036	...	...	
33,000	...	.001413	.000050	...	...	
34,000	...	.001475	.000062	...	...	
35,000	...	.001525	.000050	...	...	
36,000	...	.001563	.000038	...	...	
37,000	...	.001600	.000037	...	...	
38,000	...	.001650	.000050	...	...	
39,000	...	.001700	.000050	...	...	
40,000	...	.001775	.000075	...	...	
41,000	...	.001825	.000050	...	...	
41,800	55,220	.001863	.000038	...	...	Elastic limit.
42,000	...	.001950	.000087	...	...	
43,000	...	.015000	.013050	...	...	
44,000	...	.016088	.001088	...	...	
45,000	...	.017225	.001137	...	...	
46,000	...	.018625	.001400	...	...	
47,000	...	.020125	.001500	...	...	
48,000	...	.021850	.001725	...	...	
49,000	...	.023500	.001650	...	...	
50,000	...	.025263	.001763	...	...	
51,000	...	.027163	.001900	...	...	
52,000	...	.029188	.002025	...	...	
53,000	...	.031438	.002250	...	...	
54,000	...	.033625	.002187	...	...	
55,000	...	.036000	.002375	...	...	
56,000	...	.038750	.002750	...	...	
57,000	...	.042063	.003313	...	...	
58,000	...	.046125	.004062	...	...	
59,000	...	.049375	.003250	...	...	
60,000	...	.052875	.003500	...	...	
61,000	...	.0588	.003925	...	...	
62,000	...	.0638	.0050	...	...	
63,000	...	.0700	.0062	...	...	
64,000	...	.0788	.0088	...	...	
65,000	...	.0900	.0112	...	...	
66,000	...	.1100	.0200	...	...	
66,700	88,110	.1425	.0325	...	...	Tensile strength.
55,500	...	...	...	...	...	Load at time of rupture.

Elongation per inch after rupture, 0″.2313.

Elongation of inch sections, ″.14, ″.18, ″.17, ″20 (″.58 fractured section), ″.28, ″.17, ″.13.

Area at fracture, 1″.11 × ″.35 = .389 square inch.

Contraction of area, 48.9 per cent.

Appearance of fracture fine, silky.

No. 528.

Marks on bar, 3753 . .
Sectional area, 1″.507×″.502 = .756 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
756	1,000	0.	0.	0.	0.	Initial load.
3,780	5,000	.000125	.000125	....	....	
7,560	10,000	.000288	.000163	0.	....	
11,340	15,000	.000438	.000150	....	....	
15,120	20,000	.000613	.000175	....	....	
18,900	25,000	.000788	.000175	....	....	
22,680	30,000	.000963	.000175	....	....	
26,460	35,000	.001138	.000175	....	....	
30,240	40,000	.001288	.000150	.000025	.000025	
31,000	....	.001338	.000050	....	....	
32,000	....	.001400	.000062	....	....	
33,000	....	.001425	.000025	....	....	
34,000	....	.001475	.000050	....	....	
35,000	....	.001525	.000050	....	....	
36,000	....	.001563	.000038	....	....	
37,000	....	.001600	.000037	....	....	
38,000	....	.001650	.000050	....	....	
39,000	....	.001713	.000063	....	....	
40,000	....	.001763	.000050	....	....	
41,000	....	.001800	.000037	....	....	
42,000	....	.001850	.000050	....	....	
43,000	56,880	.001888	.000038	....	....	Elastic limit.
44,000	....	.002475	.000587	....	....	
45,000	....	.003513	.001038	....	....	
46,000	....	.004875	.001362	....	....	
47,000	....	.006500	.001625	....	....	
48,000	....	.010150	.003650	....	....	
49,000	....	.012500	.002350	....	....	
50,000	....	.013588	.001088	....	....	
51,000	....	.014688	.001100	....	....	
52,000	....	.016250	.001562	....	....	
53,000	....	.018313	.002063	....	....	
54,000	....	.020100	.001787	....	....	
55,000	....	.021875	.001775	....	....	
56,000	....	.023750	.001875	....	....	
57,000	....	.026125	.002375	....	....	
58,000	....	.028250	.002125	....	....	
50,000	....	.031500	.003250	....	....	
60,000	....	.033475	.001975	....	....	
61,000	....	.036875	.003400	....	....	
62,000	....	.040375	.003500	....	....	
63,000	....	.045625	.005250	....	....	
64,000	....	.048063	.002438	....	....	
65,000	....	.053750	.005687	....	....	
66,000	....	.0638	.010050	....	....	
67,000	....	.0750	.0112	....	....	
68,000	....	.0950	.0200	....	....	
68,280	90,320	.1225	.0275	....	....	Tensile strength.
58,300	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0″.1775.

Elongation of inch sections, ″.09, ″.10, ″.12, ″.28 (″.46 fractured section), ″.16, ″.12, ″.09.

Area at fracture, 1″.14×″.36 = .410 square inch.

Contraction of area, 45.7 per cent.

Appearance of fracture, fine, silky, with trace of granulation.

No. 529.

Marks on bar 3753 . . .
Sectional area, 1''.502 × ''.501=.752 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
752	1,000	0.	0.	0.	0.	Initial load.
3,760	5,000	.000125	.000125	....	....	
7,520	10,000	.000288	.000163	0.	....	
11,280	15,000	.000425	.000137	....	....	
15,040	20,000	.000600	.000175	....	....	
18,800	25,000	.000763	.000163	....	....	
22,560	30,000	.000950	.000187	....	....	
26,320	35,000	.001113	.000163	....	....	
30,080	40,000	.001275	.000162	.000038	.000038	
31,000	....	.001338	.000063	....	....	
32,000	....	.001400	.000062	....	....	
33,000	....	.001425	.000025	....	....	
34,000	....	.001463	.000038	....	....	
35,000	....	.001525	.000062	....	....	
36,000	....	.001588	.000063	....	....	
37,000	....	.001613	.000025	....	....	
38,000	....	.001675	.000062	....	....	
39,000	....	.001738	.000063	....	....	
40,000	53,190	.001788	.000050	....	....	Elastic limit.
41,000	....	.012225	.010437	....	....	
42,000	....	.013000	.000775	....	....	
43,000	....	.014375	.001375	....	....	
44,000	....	.015688	.001313	....	....	
45,000	....	,017100	.001412	....	....	
46,000	....	.018688	.001588	....	....	
47,000	....	.020150	.001462	....	....	
48,000	....	.021475	.001325	....	....	
49,000	....	.023138	.001663	....	....	
50,000	....	.025000	.001862	....	....	
51,000	....	.026913	.001913	....	....	
52,000	....	.028900	.001987	....	....	
53,000	....	.031000	.002100	....	....	
54,000	....	.033375	.002375	....	....	
55,000	....	.035775	.002400	....	....	
56,000	....	.038563	.002788	....	....	
57,000	....	.041500	.002937	....	....	
58,000	....	.044525	.003025	....	....	
59,000	....	.048000	.003475	....	....	
60,000	....	.051875	.003875	....	....	
61,000	....	.0588	.006925	....	....	
62,000	....	.0663	.0075	....	....	
63,000	....	.0713	.0050	....	....	
64,000	....	.0788	.0075	....	....	
65,000	....	.0888	.0100	....	....	
66,000	....	.1088	.0200	....	....	
66,710	88,710	.1350	.0262	....	....	Tensile strength.
56,000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, 0''.2125.
Elongation of inch sections, ''.12, ''.11, ''.14, ''.16 (''.41 fractured section ''.42), ''.20, ''.14.
Area at fracture, 1''.11 × ''.36 = .400 square inch.
Contraction of area, 46.8 per cent.
Appearance of fracture fine, silky.

No. 530.

Marks on bar, 3753 . . . .
Sectional area, 1″.503 × ″.502 = .754 square inch.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
754	1,000	0.	0.	0.	0.	Initial load.
3,770	5,000	.000125	.000125			
7,540	10,000	.000300	.000175	0.		
11,310	15,000	.000450	.000150			
15,080	20,000	.000613	.000163			
18,850	25,000	.000775	.000162			
22,620	30,000	.000938	.000163			
26,390	35,000	.001100	.000162			
30,160	40,000	.001275	.000175	.000013	.000013	
32,000		.001350	.000075			
33,000		.001400	.000050			
34,000		.001450	.000050			
35,000		.001475	.000025			
36,000		.001538	.000063			
37,000		.001588	.000050			
38,000		.001613	.000025			
39,000		.001663	.000050			
40,000		.001725	.000062			
41,000		.001775	.000050			
42,000	55,700	.001838	.000063			Elastic limit.
42,100		.013250	.011412			
43,000		.014250	.001000			
44,000		.015513	.001263			
45,000		.016938	.001425			
46,000		.018250	.001312			
47,000		.019825	.001575			
48,000		.021375	.001550			
49,000		.023000	.001625			
50,000		.024688	.001688			
51,000		.026663	.001975			
52,000		.028788	.002125			
53,000		.030875	.002087			
54,000		.033150	.002275			
55,000		.035638	.002488			
56,000		.038313	.002675			
57,000		.041163	.002850			
58,000		.044325	.003162			
59,000		.047625	.003300			
60,000		.051538	.003913			
61,000		.0575	.005962			
62,000		.0638	.0063			
63,000		.0713	.0075			
64,000		.0788	.0075			
65,000		.0888	.0100			
66,000		.1050	.0162			
66,670	88,420	.1425	.0375			Tensile strength.
55,800						Load at time of rupture.

Elongation per inch after rupture, 0″.2075.

Elongation of inch sections, ″.12, ″.14, ″.18 (″.57 fractured section), ″.25, ″.15, ″.15, ″.10.

Area at fracture, 1″.11 × ″.35 = .389 square inch.

Contraction of area, 48.4 per cent.

Appearance of fracture fine, silky.

No. 427.

Compression Test.

Marks, 3656.
Length, 11″.995.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.37, ″.37.
Minimum bearing surface, .892 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000130	.000130	....	....	
10,000	10,000	.000280	.000150	0.	....	
15,000	15,000	.000430	.000150	....	....	
20,000	20,000	.000620	.000190	....	....	
25,000	25,000	.000780	.000160	....	....	
30,000	30,000	.000960	.000180	....	....	
35,000	35,000	.001110	.000150	....	....	
36,000	36,000	.001140	.000080	....	....	
37,000	37,000	.001190	.000050	....	....	
38,000	38,000	.001230	.000040	....	....	
39,000	39,000	.001240	.000010	....	....	
40,000	40,000	.001280	.000040	.000020	.000020	
41,000	41,000	.001320	.000040	....	....	
42,000	42,000	.001360	.000040	....	....	
43,000	43,000	.001390	.000030	....	....	
44,000	44,000	.001430	.000040	....	....	
45,000	45,000	.001470	.000040	....	....	
46,000	46,000	.001490	.000020	....	....	
47,000	47,000	.001520	.000030	....	....	
48,000	48,000	.001560	.000040	....	....	
49,000	49,000	.001600	.000040	....	....	
50,000	50,000	.001620	.000020	....	....	
51,000	51,000	.001670	.000050	....	....	
52,000	52,000	.001710	.000040	....	....	
53,000	53,000	.001750	.000040	....	....	
54,000	54,000	.001780	.000030	....	....	Elastic limit.
54,500	54,500	.001830	.000050	....	....	
55,000	55,000	.001850	.000020	....	....	
55,500	55,500	.001890	.000040	....	....	
56,000	56,000	.001920	.000030	....	....	
56,500	56,500	.001990	.000070	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	54,000
Compression per inch under stress at elastic limit	inch..	0.001780
Ultimate strength per square inch of original section	pounds..	56,500
Manner of failure		triple flexure

No. 428.

Compression Test.

Marks, 3656 . .
Length, 12″.00.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.37, ″.39.
Minimum bearing surface, .881 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000140	.000140	....	....	
10,000	10,000	.000300	.000160	.000020	.000020	
15,000	15,000	.000470	.000170	....	....	
20,000	20,000	.000620	.000150	....	....	
25,000	25,000	.000780	.000160	....	....	
30,000	30,000	.000970	.000190	....	....	
35,000	35,000	.001120	.000150	.000040	.000020	
40,000	40,000	.001290	.000170	.000050	.000010	
41,000	41,000	.001320	.000030	....	....	
42,000	42,000	.001370	.000050	....	....	
43,000	43,000	.001410	.000040	....	....	
44,000	44,000	.001450	.000040	....	....	
45,000	45,000	.001470	.000020	....	....	
46,000	46,000	.001500	.000030	....	....	
47,000	47,000	.001520	.000020	....	....	
48,000	48,000	.001560	.000040	....	....	
49,000	49,000	.001600	.000040	....	....	
50,000	50,000	.001630	.000030	....	....	
51,000	51,000	.001650	.000020	....	....	
52,000	52,000	.001690	.000040	....	....	
53,000	53,000	.001730	.000040	....	....	
54,000	54,000	.001770	.000040	....	....	
55,000	55,000	.001820	.000050	....	....	Elastic limit.
55,500	55,500	.001860	.000040	***Maximum***	....	
55,700	55,700	.001910	.000050	***deflection***	....	
55,800	55,800	.004850 .0100	.002040 .005150	***chord*, 10″.** .10	....	
55,900	55,900	.0110	.0010	.15	....	
56,000	56,000	.0110	0.	.19	....	
56,100	56,100	.0110	0.	.20	....	
56,200	56,200	.0110	0.	.22	....	
56,350	56,350	.0110	0.	.24	....	
56,500	56,500	.0120	.0010	.27	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	55,000
Compression per inch under stress at elastic limit	inch..	0.001820
Ultimate strength, per square inch of original section	pounds..	56,500
Manner of failure		triple flexure

No. 429.

Compression Test.

Marks, 3711.
Length, 12″.00 .
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.35, ″.35.
Minimum bearing surface, .904 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	....	....	
10,000	10,000	.000260	.000140	0.	....	
15,000	15,000	.000410	.000150	....	....	
20,000	20,000	.000580	.000170	....	....	
25,000	25,000	.000730	.000150	....	....	
30,000	30,000	.000890	.000160	....	....	
35,000	35,000	.001080	.000190	....	....	
40,000	40,000	.001240	.000160	.000020	.000020	
41,000	41,000	.001280	.000040	....	....	
42,000	42,000	.001320	.000040	....	....	
43,000	43,000	.001370	.000050	....	....	
44,000	44,000	.001410	.000040	....	....	
45,000	45,000	.001440	.000030	....	....	
46,000	46,000	.001470	.000030	....	....	
47,000	47,000	.001490	.000020	....	....	
48,000	48,000	.001530	.000040	....	....	
49,000	49,000	.001560	.000030	....	....	
50,000	50,000	.001590	.000030	*Maximum deflection chord*, 10″.	....	
51,000	51,000	.001610	.000020		....	
52,000	52,000	.001640	.000030		....	Elastic limit.
52,700	52,700	.001670 .012000	.000030 .010330	.20	....	
53,000	53,000	.0130	.0010	.23	....	
53,300	53,300	.0140	.0010	.28	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	52,000
Compression per inch under stress at elastic limit	inch..	0.001640
Ultimate strength per square inch of original section	pounds..	53,300
Manner of failure		triple flexure

No. 430.

Compression Test.

Marks, 3711 . .
Length, 11″.994.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.34, ″.36.
Minimum bearing surface, .898 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000120	.000120	....	....	
10,000	10,000	.000270	.000150	0.	....	
15,000	15,000	.000420	.000150	....	....	
20,000	20,000	.000590	.000170	....	....	
25,000	25,000	.000760	.000170	....	....	
30,000	30,000	.000920	.000160	....	....	
35,000	35,000	.001080	.000160	....	....	
40,000	40,000	.001240	.000160	.000020	.000020	
41,000	41,000	.001280	.000040	....	....	
42 000	42,000	.001320	.000040	....	....	
43,000	43,000	.001370	.000050	....	....	
44,000	44,000	.001410	.000040	....	....	Elastic limit.
44,500	44,500	.001490	.000080	....	....	
45,000	45,000	.002240	.000750	....	....	
46,000	46,000	.002500	.000260	*Maximum deflection chord* 10″.	....	
47,000	47,000	.003600	.001100		....	
48,000	48,000	.004450	.000850		....	
49,000	49,000	.005600	.001150	.02	....	
50,000	50,000	.0100	.0044	.03	....	
51,000	51,000	.0120	.0020	.05	....	
52,000	52,000	.0120	0.	.06	....	
53,000	53,000	.0130	.0010	.08	....	
54,000	54,000	.0140	.0010	.10	....	
54,940	54,940	.0150	.0010	.17	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	44,000
Compression per inch under stress at elastic limit	inch..	0.001410
Ultimate strength per square inch of original section	pounds..	54,940
Manner of failure		triple flexure

No. 430½.

Compression Test.

Marks, 3730 .
Length, 11″.988.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.33, ″.35.
Minimum bearing surface, .904 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	....	....	
10,000	10,000	.000270	.000160	0.	....	
15,000	15,000	.000440	.000170	....	....	
20,000	20,000	.000600	.000160	....	....	
25,000	25,000	.000750	.000150	....	....	
30,000	30,000	.000920	.000170	....	....	
35,000	35,000	.001080	.000160	....	....	
40,000	40,000	.001260	.000180	.000040	.000040	
41,000	41,000	.001320	.000060	....	....	
42,000	42,000	.001350	.000030	....	....	
43,000	43,000	.001400	.000050	....	....	
44,000	44,000	.001440	.000040	*Maximum*	....	Elastic limit.
44,100	44,100	.001560	.000120	*deflection*	....	
44,200	44,200	.002900	.001340	*chord* 10″.	....	
45,000	45,000	.004150	.001250	.01	....	
46,000	46,000	.0060	.001850	.08?	....	
47,000	47,000	.0080	.0020	.07	....	
48,000	48,000	.0090	.0010	.09	....	
49,000	49,000	.0100	.0010	.10	....	
50,000	50,000	.0100	0.	12	....	
51,000	51,000	.0120	.0020	.14	....	
52,000	52,000	.0140	.0020	.22	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	44,000
Compression per inch under stress at elastic limit	inch..	0.001440
Ultimate strength per square inch of original section	pounds..	52,000
Manner of failure		triple flexure

No. 431.

Compression Test.

Marks, 3730..
Length, 11''.990.
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Diameter of centers, ''.33, ''.35.
Minimum bearing surface, .904 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	....	....	
10,000	10,000	.000270	.000160	0.	....	
15,000	15,000	.000430	.000160	....	....	
20,000	20,000	.000590	.000160	....	....	
25,000	25,000	.000760	.000170	....	....	
30,000	30,000	.000930	.000170	....	....	
35,000	35,000	.001120	.000190	....	....	
40,000	40,000	.001270	.000150	.000020	.000020	
41,000	41,000	.001310	.000040	....	....	
42,000	42,000	.001330	.000020	....	....	Elastic limit.
42,400	42,400	.001340	.000010	*Maximum deflection chord* 10''.	....	
		.002080	.000740		....	
43,000	43,000	.002800	.000720		....	
44,000	44,000	.005600	.002800	.03	....	
45,000	45,000	.0080	.0024	.09	....	
46,000	46,000	.0090	.0010	.12	....	
47,000	47,000	.0100	.0010	.13	....	
48,000	48 000	.0110	.0010	.15	....	
49,000	49,000	.0130	.0020	.23	....	
49,760	49,760	.0140	.0010	.28	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	42,000
Compression per inch under stress at elastic limit	inch..	0.001330
Ultimate strength per square inch of original section	pounds..	49,760
Manner of failure		triple flexure

No. 432.

Compression Test.

Marks, 3741.
Length, 11″.987.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameters of centers, ″.38, ″.42.
Minimum bearing surface, .861 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000130	.000130	....	....	
10,000	10,000	.000290	.000160	0.	....	
15,000	15,000	.000440	.000150	....	....	
20,000	20,000	.000610	.000170	....	....	
25,000	25,000	.000770	.000160	....	....	
30,000	30,000	.000940	.000170	....	....	
35,000	35,000	.001110	.000170	....	....	
40,000	40,000	.001280	.000170	.000030	.000030	
41,000	41,000	.001320	.000040	....	....	
42,000	42,000	.001370	.000050	....	....	
43,000	43,000	.001400	.000030	....	....	
44,000	44,000	.001430	.000030	....	....	
45,000	45,000	.001470	.000040	....	....	
46,000	46,000	.001500	.000030	....	....	
47,000	47,000	.001520	.000020	....	....	
48,000	48,000	.001560	.000040	....	....	
49,000	49,000	.001590	.000030	....	....	
50,000	50,000	.001620	.000030	....	....	
51,000	51,000	.001660	.000040	....	....	
52,000	52,000	.001700	.000030	....	....	
53,000	53,000	.001730	.000030	....	....	
54,000	54,000	.001770	.000040	....	....	
55,000	55,000	.001820	.000050	*Maximum*	....	
56,000	56,000	.001870	.000050	*deflection*	....	
56,800	56,800	.001890	.000020	*chord* 10″.	....	Elastic limit.
57,000	57,000	....	....	.6	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	56,800
Compression per inch under stress at elastic limit	inch..	0.001890
Ultimate strength per square inch of original section	pounds..	57,000
Manner of failure		triple flexure

No. 433.

Compression Test.

Marks, 3741 . .
Length, 11″.996.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.36, ″.38.
Minimum bearing surface, .887 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	0.	0.	Initial load.
5,000	5,000	.000110	.000110	....	....	
10,000	10,000	.000270	.000160	0.	....	
15,000	15,000	.000420	.000150	....	....	
20,000	20,000	.000580	.000160	....	....	
25,000	25,000	.000740	.000160	....	....	
30,000	30,000	.000910	.000170	....	....	
35,000	35,000	.001080	.000170	....	....	
40,000	40,000	.001240	.000160	.000020	.000020	
41,000	41,000	.001280	.000040	....	....	
42,000	42,000	.001310	.000030	....	....	
43,000	43,000	.001340	.000030	....	....	
44,000	44,000	.001380	.000040	....	....	
45,000	45,000	.001420	.000040	....	....	
46,000	46,000	.001470	.000050	....	....	
47,000	47,000	.001490	.000020	....	....	
48,000	48,000	.001520	.000030	....	....	
49,000	49,000	.001570	.000050	....	....	
50,000	50,000	.001590	.000020	*Maximum*	....	
51,000	51,000	.001620	.000030	*deflection.*	....	
52,000	52,000	.001670	.000050	*Chord* 10″.	....	
53,000	53,000	.001720	.000050		....	Elastic limit.
53,100	53,100	.002430	.000710		....	
53,480	53,480	.002890	.000460		....	
54,000	54,000	.0100	.007110		.13	
55,000	55,000	.0110	.0010		.15	
55,900	55,900	.0140	.0030		.25	Ultimate strength.

General summary.

Elastic limit per square inch of original section ....pounds.. 53,000
Compression per inch under stress at elastic limit ....inch.. 0.001720
Ultimate strength per square inch of original section ....pounds.. 55,900
Manner of failure..triple flexure

No. 434.

Compression Test.

Marks, 3753 .
Length, 11″.992.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.34, ″.42.
Minimum bearing surface, .861 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
1, 000	1, 000	0.	0.	0.	0.	Initial load.
5, 000	5, 000	.000120	.000120	....	....	
10, 000	10, 000	.000280	.000160	0.	....	
15, 000	15, 000	.000430	.000150	....	....	
20, 000	20, 000	.000620	.000190	....	....	
25, 000	25, 000	.000780	.000160	....	....	
30, 000	30, 000	.000950	.000170	....	....	
35, 000	35, 000	.001110	.000160	....	....	
40, 000	40, 000	.001280	.000170	.000040	.000040	
41, 000	41, 000	.001320	.000040	....	....	
42, 000	42, 000	.001390	.000070	....	....	
43, 000	43, 000	.001420	.000030	....	....	
44, 000	44, 000	.001470	.000050	....	....	
45, 000	45, 000	.001490	.000020	....	....	
46, 000	46, 000	.001520	.000030	....	....	
47, 000	47, 000	.001570	.000050	....	....	
48, 000	48, 000	.001000	.000030	....	....	
49, 000	49, 000	.001030	.000030	....	....	
50, 000	50, 000	.001670	.000040	....	....	
50, 800	50, 800	.001720	.000050	....	....	Elastic limit.
51, 000	51,000	.001790	.000070	....	....	
51, 500	51, 500	.001870	.000080	....	....	
52, 000	52, 000	.001950	.000080	....	....	
52, 500	52, 500	.002030	.000080	....	....	
53, 000	53, 000	.002110	.000080	....	....	
53, 500	53, 500	.002210	.000100	....	....	
54, 000	54, 000	.002280	.000070	....	....	
54, 500	54, 500	.002410	.000130	....	....	
55, 000	55, 000	.002520	.000110	....	....	
55, 500	55, 500	.002630	.000110	....	....	
56, 000	56, 000	.002720	.000090	.000970	.000930	
56, 500	56, 500	.002860	.000140	....	....	
57, 000	57, 000	.002940	.000080	....	....	
57, 500	57, 500	.003090	.000150	....	....	
58, 000	58, 000	.003280	.000190	....	....	Ultimate strength.

General summary.

Elastic limit per square inch of original section	pounds..	50, 800
Compression per inch under stress at elastic limit	inch..	0. 001720
Ultimate strength per square inch of original section	pounds..	58, 000
Manner of failure		triple flexure

No. 435.

Compression Test.

Marks, 3753 . .
Length, 11″.995.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Diameter of centers, ″.41, ″.41.
Minimum bearing surface, .868 square inch.

Applied loads.		Compression per inch.	Successive compression per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch*	
1, 000	1, 000	0.	0.	0.	0.	Initial load.
5, 000	5, 000	.000120	.000120	....	....	
10, 000	10, 000	.000280	.000160	0.	....	
15, 000	15, 000	.000440	.000160	....	....	
20, 000	20, 000	.000610	.000170	....	....	
25, 000	25, 000	.000770	.000160	....	....	
30, 000	30, 000	.000930	.000160	....	....	
35, 000	35, 000	.001100	.000170	....	....	
40, 000	40, 000	.001270	.000170	.000020	.000020	
41, 000	41, 000	.001300	.000030	....	....	
42, 000	42, 000	.001340	.000040	....	....	
43, 000	43, 000	.001380	.000040	....	....	
44, 000	44, 000	.001420	.000040	....	....	
45, 000	45, 000	.001460	.000040	....	....	
46, 000	46, 000	.001490	.000030	....	....	
47, 000	47, 000	.001530	.000040	....	....	
48, 000	48, 000	.001580	.000050	....	....	
48, 500	48, 500	.001600	.000020	....	....	Elastic limit.
49, 000	49, 000	.001680	.000080	....	....	
49, 500	49, 500	.001740	.000060	*Maximum*	....	
50, 000	50, 000	.001850	.000110	*deflection*	....	
50, 500	50, 500	.001920	.000070	*chord* 10″.	....	
51, 000	51, 000	.002150	.000230	.03	....	
52, 000	52, 000	.0110	.008850	.15	....	
53, 000	53, 000	.0160	.0050	.24	....	Ultimate strength.

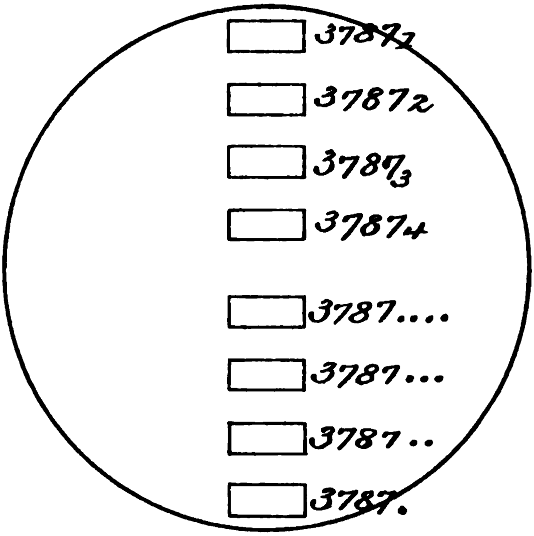
General summary.

Elastic limit per square inch of original section	pounds..	48, 500
Compression per inch under stress at elastic limit	inch..	0. 001600
Ultimate strength per square inch of original section	pounds..	53, 000
Manner of failure		triple flexure

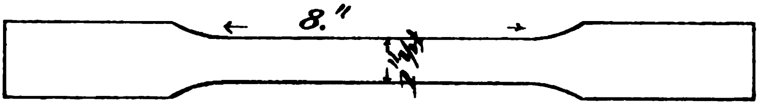
STEEL SPECIMENS FROM THE NEW SHAFT OF THE DOLPHIN.

New Shaft of the Dolphin.

Location of specimens



Form of specimens.



No. 552.

Elongations of specimens measured with dividers and scale, after elastic limits were passed.

Marks, 3787_1.

Sectional area, 1″.245 × ″.751 = .935 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
38,000	....	.13	....	
40,000	....	.16	....	
42,000	....	.18	....	
44,000	....	.19	....	
46,000	....	.22	....	
48,000	....	.24	....	
50,000	....	.27	....	
52,000	....	.33	....	
54,000	....	.36	....	
56,000	....	.43	....	
58,000	....	.50	....	
60,000	....	.60	....	
62,000	....	.75	....	
64,000	....	1.03	....	
64,920	69,529	1.37	....	Tensile strength.
52,100	....	....	....	Load at time of rupture.

Elongation after rupture, 1″.71 = 21.4 per cent.

Elongation of inch sections, ″.14, ″.15, ″.15, ″.18, ″.23, ″.43*, ″.26, ″.17.

Area at fracture, 1″.03 × ″.61 = .628 square inch.

Contraction of area, 32.8 per cent.

Appearance of fracture, dull silky 50 per cent. granular, radiating from the silky section 50 per cent.

No. 553.

Marks, 3787_2

Sectional area, 1″.245 × ″.755 = .940 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
34,000	....	.04	....	
36,000	....	.05	....	
38,000	....	.06	....	
40,000	....	.065	....	
42,000	....	.08	....	
44,000	....	.09	....	
46,000	....	.11	....	
48,000	....	.13	....	
50,000	....	.17	....	
52,000	....	.20	....	
54,000	....	.23	....	
56,000	....	.25	....	
58,000	....	.30	....	
60,000	....	.35	....	
62,000	....	.40	....	
64,000	....	.46	....	
66,000	....	.57	....	
66,300	70,532	....	....	Tensile strength. Fractured suddenly under the maximum load

Elongation after rupture, ″.58 = 7.2 per cent.

Elongation of inch sections, ″.09*, ″.06, ″.06, ″.08, ″.07, ″.07.

Area at fracture, ″1.20 × ″.74 = .888 square inch.

Contraction of area, 5.5 per cent.

Appearance of fracture, granular 100 per cent., radiating from a center near one corner of the fractured surface.

No. 554.

Marks, 3787_3.
Sectional area, 1″.245 × ″.755 = .940 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
38,000	....	.04	....	
40,000	....	.05	....	
42,000	....	.055	....	
44,000	....	.055	....	
46,000	....	.065	....	
48,000	....	.08	....	
50,000	....	.09	....	
52,000	....	.11	....	
54,000	....	.13	....	
56,000	....	.14	....	
58,000	....	.17	....	
60,000	....	.21	....	
62,000	....	.23	....	
64,000	....	.25	....	
66,000	....	.29	....	
68,000	....	.34	....	
70,000	....	.87	....	
71,500	76,064	....	....	Tensile strength. Broke under the maximum load.

Elongation after rupture, ″.39=4.9 per cent.
Elongation of inch sections, ″.06, ″.06*, ″.06, ″.04, ″.05, ″.04, ″.05, ″03.
Area at fracture, 1″.22 × ″.73 = .891 square inch.
Contraction of area, 5.2 per cent.
Appearance of fracture, granular 100 per cent., radiating from a point at the middle of one edge of the bar.

No. 555.

Marks, 3787_4.
Sectional area, 1″.232 × ″.752 = .927 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
42,000	....	.03	....	
44,000	....	.035	....	
46,000	....	.035	....	
48,000	....	.04	....	
50,000	....	.05	....	
52,000	....	.06	....	
54,000	....	.075	....	
56,000	....	.10	....	
58,000	....	.11	....	
60,000	....	.12	....	
62,000	....	.14	....	
64,000	....	.15	....	
65,150	70,280	....	....	Tensile strength. Broke under the maximum load.

Elongation after rupture, ″.16 = 2.0 per cent.
Elongation of inch sections, ″.04, ″.02, ″.02, ″.01, ″.02, ″.01, ″.02, ″.02.
Area at fracture, 1″.22 × ″.75 = .915 square inch.
Contraction of area, 1.3 per cent.
Appearance of fracture, granular 100 per cent., radiating from a point ¼″ from edge of fractured surface.

No. 556.

Marks, 3787.
Sectional area, 1″.250 × ″.503 = .629 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
30,000	....	.035	....	
31,000	....	.09	....	
32,000	....	.195	....	
33,000	....	.195	....	
34,000	....	.20	....	
35,000	....	.21	....	
36,000	....	.23	....	
37,000	....	.25	....	
38,000	....	.27	....	
39,000	....	.30	....	
40,000	....	.33	....	
41,000	....	.38	....	
42,000	....	.43	....	
43,000	....	.49	....	
44,000	....	.58	....	
45,000	....	.69	....	
45,500	....	.77	....	
46,000	....	.88	....	
46,500	....	.98	....	
47,000	....	1.22	....	
47,180	....	1.34	....	
47,500	75,517	1.49	....	Tensile strength.
42,100	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.03 = 25.4 per cent.

Elongation of inch sections, ″.13, ″.19, ″.25, ″.62*, ″.28, ″.21, ″.18, ″.17.

Area at fracture ″.90 × ″.34 = ″.306 square inch.

Contraction of area, 51.3 per cent.

Appearance of fracture silky, traces of lamination.

No. 557.

Marks, 3787.
Sectional area, 1″.250 × ″.505 = .631 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
26,000	....	.03	....	
27,000	....	.035	....	
28,000	....	.04	....	
29,000	....	.04	....	
30,000	....	.045	....	
31,000	....	.05	....	
32,000	....	.14	....	
33,000	....	.17	....	
34,000	....	.19	....	
35,000	....	.22	....	
36,000	....	.25	....	
37,000	....	.27	....	
38,000	....	.32	....	
39,000	....	.36	....	
40,000	....	.43	....	
41,000	....	.47	....	
42,000	....	.52	....	
43,000	....	.63	....	
44,000	....	.73	....	
45,000	....	.89	....	
45,500	....	1.25	....	
46,000	....	1.40	....	
46,100	73,059	1.58	....	Tensile strength.
40,000	....	....	....	Load at time of rupture.

Elongation after rupture, 2″.26 = 28.2 per cent.
Elongation of inch sections, ″.18, ″.21, ″.27, ″.68*, ″.30, ″.24, ″.22, ″.16.
Area at fracture, ″.88 × ″.32 = .282 square inch.
Contraction of area, 55.3 per cent.
Appearance fine, silky; trace of lamination.

No. 558.

Marks, 3787...
Sectional area, 1″.250 × ″.441=.551 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
27,000		.03		
28,000		.035		
29,000		.035		
30,000		.045		
31,000		.08		
32,000		.24		
33,000		.30		
34,000		.31		
35,000		.34		
36,000		.40		
37,000		.45		
38,000		.52		
39,000		.62		
40,000		.70		
41,000		.87		
42,000		1.18		
42,460	77,060	1.85		Tensile strength.
37,100				Load at time of rupture.

Elongation after rupture, 2″.11 = 26.4 per cent.

Elongation of inch sections, ″.17, ″.21, ″.23, ″.41*, ″.50*, ″.25, ″.19, ″.15.

Area at fracture, ″.91 × ″.30 = .273 square inch.

Contraction of area, 50.4 per cent.

Fracture took place at center punch mark of inch section. Appearance silky; trace of lamination.

No. 559.

Marks, 3787 ....
Sectional area, 1″.250 × ″.441 = .551 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
27,000		.04		
28,000		.19		
29,000		.24		
30,000		.28		
31,000		.295		
32,000		.33		
33,000		.37		
34,000		.42		
35,000		.48		
36,000		.58		
37,000		.68		
38,000		.83		
39 000		1.07		
39,600	71,870	1.54		Tensile strength.
34,500				Load at time of rupture.

Elongation after rupture, 1″.93 = 24.1 per cent.

Elongation of inch sections, ″.18, ″.20, ″.30*, ″.58*, ″.20, ″.15, ″.17, ″.15.

Area at fracture, ″.91 × ″.31 = .282 square inch.

Contraction of area, 48.8 per cent.

Fracture took place at center punch mark of inch section. Appearance fine, silky; trace of lamination.

TABULATION OF TENSION SPECIMENS FROM SHAFTS

FOR STEEL CRUISERS BOSTON, ATLANTA, AND CHICAGO, AND DISPATCH BOAT DOLPHIN.

No. of test.	Mark.	Name of vessel.	Position in shaft.	Dimensions.		Sectional area.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 8″.	Contraction of area.	Appearance of fracture.
				Width.	Thickness.						
				Inches.	*Inch.*	*Sq. in.*	*Pounds.*	*Pounds.*	*Per cent.*	*Per cent.*	
495	3487.	Boston	Outboard line	1.490	.500	.745	53,020	93,660	20.6	39.8	Silky, slightly granular, spongy center.
496	3487..	do	do	1.495	.496	.742	54,580	97,040	13.5	40.2	Do.
497	3487...	do	do	1.495	.493	.737	62,420	92,880	17.4	42.9	Fine granular and spongy, silky edges.
498	3487....	do	do	1.493	.498	.744	60,480	100,670	11.4	36.0	Silky, slightly granular, spongy center.
499	3637.	do	Inboard line	1.502	.505	.758	49,210	89,520	19.3	38.3	Granular, spongy center, silky edges.
500	3637..	do	do	1.504	.502	.755	50,330	89,390	20.9	40.1	Silky, trace of granulation, spongy center.
501	3637...	do	do	1.500	.503	.754	54,380	89,200	17.8	37.4	Fine granular, silky edges.
502	3637....	do	do	1.500	.504	.756	48,810	93,170	18.0	34.9	Fine granular, spongy center.
503	3639.	Atlanta	do	1.492	.504	.752	46,540	73,920	24.5	40.4	Fine silky.
504	3639..	do	do	1.500	.505	.757	47,560	73,740	23.6	41.7	Silky, trace of granulation.
505	3639...	do	do	1.503	.498	.748	45,450	74,670	19.8	41.0	Silky, stratified.
506	3639....	do	do	1.505	.503	.757	51,250	75,090	20.5	37.6	Silky, slightly granular.
507	3641.	do	Outboard line	1.504	.497	.747	54,850	84,200	19.3	41.0	Do.
508	3641..	do	do	1.500	.498	.747	58,900	82,920	23.8	39.5	Do.
509	3641...	do	do	1.444	.495	.715	50,350	85,030	20.5	41.5	Granular, spongy center.
510	3641....	do	do	1.500	.500	.750	48,000	83,550	23.8	44.8	Silky, trace of granulation.
511	3656.	Chicago	Inboard line	1.500	.503	.754	53,040	94,220	14.9	36.9	Granular, silky edges.
512	3656..	do	do	1.502	.505	.758	59,870	93,890	15.1	40.4	Silky, slightly granular.
513	3656...	do	do	1.500	.503	.754	56,760	96,020	14.4	39.0	Silky and granular, spongy center.
514	3656....	do	do	1.504	.503	.756	59,520	97,160	17.4	39.1	Granular, 60 per cent.; silky edges, 40 per cent.
515	3711.	do	Thrust bearing line	1.500	.505	.757	51,520	84,940	17.1	43.7	Silky.
516	3711..	do	do	1.502	.502	.754	43,770	85,610	22.4	45.1	Do.
517	3711...	do	do	1.501	.502	.753	53,120	84,700	22.0	45.6	Fine silky.
518	3711....	do	do	1.503	.503	.756	57,670	87,450	20.6	46.7	Do.
519	3730.	do	Outboard line	1.500	.504	.756	61,770	107,140	17.6	42.7	Silky edges, spongy center, granular sides.
520	3730..	do	do	1.500	.505	.758	62,010	107,850	16.0	43.9	Silky, slightly granular.
521	3730...	do	do	1.502	.502	.754	64,990	105,970	10.5	42.0	Do.
522	3730....	do	do	1.502	.497	.746	64,840	110,000	16.1	41.4	Do.
523	3741.	do	do	1.500	.500	.750	54,670	87,950	21.6	50.1	Fine silky.
524	3741..	do	do	1.500	.497	.745	60,400	88,860	18.8	45.9	Do.
525	3741...	do	do	1.502	.496	.745	50,740	87,380	20.9	45.9	Silky.
526	3741....	do	do	1.502	.498	.748	60,160	87,850	18.1	44.0	Fine silky.
527	3758.	do	Inboard line	1.503	.504	.757	55,220	88,110	23.1	48.9	Do.
528	3758..	do	do	1.507	.502	.756	56,880	90,820	17.8	45.7	Fine silky, trace of granulation.

529	3753...	....do	.......do	1.502	.501	.752	53,190	88,710	21.2	46.8	Do.
530	3753....	....do	.......do	1.503	.502	.754	55,700	88,420	20.8	48.4	Do.
552	3787_1	Dolphin	....	1.245	.751	.935	86,680	69,529	21.4	32.8	Dull silky, 50 per cent.; granular, 50 per cent.
553	3787_2	....do	....	1.245	.755	.940	31,700	70,532	7.2	5.5	Granular, 100 per cent.
554	3787_3	....do	....	1.245	.755	.940	86,060	76,064	4.9	5.2	Do.
555	3787_4	....do	....	1.232	.752	.927	89,910	70,280	2.0	1.3	Do.
556	3787.	....do	....	1.250	.508	.629	46,080	75,517	25.4	51.3	Silky, traces of granulation.
557	3787..	....do	....	1.250	.505	.631	40,618	73,059	28.2	55.3	Do.
558	3787...	....do	....	1.250	.441	.551	47,910	77,060	26.4	50.4	Do.
559	3787....	....do	....	1.250	.441	.551	47,460	71,870	24.1	48.8	Fine silky, traces of granulation.

TABULATION OF COMPRESSION SPECIMENS FROM SHAFTS

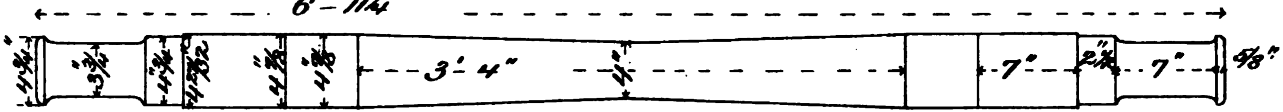
FOR STEEL CRUISERS BOSTON, ATLANTA, AND CHICAGO.

Number of test.	Marks.	Name of vessel.	Position in shaft.	Length.	Diameter.	Sectional area.	Elastic limit per square inch.	Ultimate strength per square inch.	Manner of failure.
				Inches.	*Inches.*	*Square inch.*	*Pounds.*	*Pounds.*	
421	3487	Boston	Outboard line	11.990	1.129	1.00	50,000	59,800	Triple flexure.
422	3637.	do	Inboard line	12.000	1.129	1.00	50,000	52,000	Do.
423	3637..	do	do	12.000	1.129	1.00	50,500	52,500	Do.
424	3639.	Atlanta	do	12.000	1.129	1.00	43,000	45,700	Do.
425	3639..	do	do	11.906	1.129	1.00	46,700	49,300	Do.
426	3641	do	Outboard line	11.980	1.129	1.00	45,000	52,300	Do.
427	3656.	Chicago	Inboard line	11.995	1.129	1.00	54,000	56,500	Do
428	3656..	do	do	12.000	1.129	1.00	55,000	56,500	Do.
429	3711.	do	Thrust bearing line	12.000	1.129	1.00	52,000	53,300	Do.
430	3711..	do	do	11.994	1.129	1.00	41,000	54,940	Do.
430½	3730.	do	Outboard line	11.988	1.129	1.00	44,000	52,000	Do.
431	3730..	do	do	11.990	1.129	1.00	42,000	49,760	Do.
432	3741.	do	do	11.987	1.129	1.00	56,800	57,000	Do.
433	3741..	do	do	11.996	1.129	1.00	53,000	55,900	Do.
434	3753.	do	Inboard line	11.992	1.129	1.00	50,800	58,000	Do.
435	3753..	do	do	11.995	1.129	1.00	48,500	53,000	Do.

21.—WROUGHT-IRON RAILWAY AXLES.

[Tensile tests of tender-axles. Master car builders standard, forged from double-rolled muck bars.]

Master Car Builders' Standard Axle.



S Ex 36 49 1

This series of axle tests, began September, 1883, is carried on for the purpose of determining whether a change in structure takes place in a metal originally ductile and fibrous to a brittle, granular, or crystalline state, resulting from exposure to such conditions as are met with in the ordinary service of a railway axle.

Twelve axles were forged from one lot of double-rolled muck bars, and in their manufacture were practically treated alike. Each axle was made from a pile composed of nine bars, each 6″ wide, ¾″ thick, and 3′ 5″ long, and was finished in four heats, two heats for each end.

The forging was done by the Boston Forge Co., in their improved hammer dies, which finish the axle very nearly to its final dimensions.

Two axles were taken for immediate test, to show the quality of the finished metal before it had performed any railway service, and serve as standards to compare with the remaining ten axles, to be tested after they had been in use.

The axles are in use in the tender trucks of express locomotives of the Boston and Albany Railroad. Mr. A. B. Underhill, superintendent of motive power, contributes the axles and furnishes the record of their mileage.

These tenders have two trucks of four 33″ wheels each, and weigh when fully loaded with 6 tons of coal and 3,000 gallons of water 67,600 pounds. They make daily trips from Boston to Springfield and return, thus running 1,400 miles per week, with occasional extra trips.

Observations were made on the deflection of the axles in the trucks. For this purpose a bar was suspended from the axle, carrying at the middle of its length a micrometer screw; the points of support were 46½″ apart, just inside the wheels. The initial reading of the micrometer was taken with the weight of the tender carried by hydraulic jacks, then bringing the load on the axles by tripping the jacks, and taking micrometer reading with the axle in its deflected shape.

Deflection of axles in place. V. sine for chord of 46½″.

Tenders fully loaded.

Tender.	Forward truck		Rear truck.	
	Forward.	Rear.	Forward.	Rear.
	Inch.	*Inch.*	*Inch.*	*Inch.*
No. 129	....	....	.0315	.0271
No. 134	....	....	.0170	.0213
No. 136	.0304	.0195	.0311	.0317

Tender No. 134 was lowered slowly with the jacks upon the axles, which accounts, it is thought, for the deflection observed in this case being less than for the others, by not disturbing the friction of the wheels on the track.

Subsequent observations were made on the axles of tender No 136, which had been changed to tender No. 150, using on this occasion a deflection bar attached to the axles, 46″ between end supports.

The bar revolved with the axles, and micrometer readings were taken on the compression and tension sides alternately as the tender was moved. Correcting the micrometer readings for the sag of the deflection bar, the following results show the total movement from the under or compression side to the upper or tension side of the axles at the middle of their length.

Deflection of axles in place. V. sine for chord of 46″.

Tender.	Forward truck.		Rear truck.		Remarks.
	Forward.	Rear.	Forward.	Rear.	
	Inch.	*Inch.*	*Inch*	*Inch.*	
No. 150	.0546	.0562	.0579	.0620	Tender partially loaded with 1 ton of coal and 1,500 gallons of water.
No. 150	.0750	....	....	.0660	Tender fully loaded with 6 tons of coal and 3,000 gallons of water.

After a run of 95,000 miles, the rear axle of the rear truck of tender No. 134, marked M B_3 was removed for testing.

Loaded transversely in the testing machine with supports 46½″ apart, gave the following deflections:

Applied loads.	Deflection at middle.	Deflection set.	Remarks.
Pounds.	*Inch.*	*Inch.*	
200	0.	0.	Initial load.
400	.0014	....	
600	.0028	....	
800	.0041	....	
1,000	.0053	....	
1,400	.0078	....	
1,800	.0104	....	
2,000	.0119	....	
2,400	.0146	....	
2,800	.0173	....	
3,000	.0188	....	
3,400	.0218	....	
3,800	.0241	....	
4,000	.0254	....	
200	....	.0024	
4,000	.0259	....	
4,400	.0282	....	
4,800	.0301	....	
5,000	.0321	....	
5,200	.0334	....	
200	....	.0035	

Second loading of axle.

Applied loads.	Deflection at middle.	Deflection set.	Remarks.
Pounds.	*Inch.*	*Inch.*	
200	0.	0.	Initial load.
1,200	.0063	....	
2,200	.0123	....	
3,200	.0186	....	
4,200	.0246	....	
5,200	.0307	....	
200	....	.0003	
5,200	.0307	....	
200	....	.0003	

Regarding the axle for the time being as cylindrical 3″.96 diameter, the modulus of elasticity by computation will be 28,541,000 pounds.

Applying this modulus to the deflections observed in rear axle of the rear trucks of tender No. 150, the maximum fiber strain is found to be 9,935 pounds per square inch, when the tender was partially loaded, and 14,900 pounds per square inch when fully loaded.

Taken together the tensile and compressive stresses, which are equal, amount to 19,870 and 29,800 pounds per square inch respectively as the range of stresses over which the metal works.

This definition of the limits of the stresses must be regarded as approximate. There are influences which tend to increase the maximum fiber strain, such as unevenness of the track, the side thrust of the wheel flanges against the rails. On the other hand, the inertia of the axle, particularly under high rates of speed, would exert a restraining influence on the total deflection.

Nine tensile specimens were taken from each axle; three from each end, including the section of axle between the box and wheel bearings, and three from the middle of its length. They are marked M. B., with the number of the axle; also a sub-number and letter to indicate from what part of the axle each was taken.

Axles M. B.$_1$ and M. B.$_2$ were cut in the lathe to the required lengths for test pieces, using a cutting-off tool till the diameter was reduced to about 1½″, then breaking off the sections transversely under a screw press. The fractures thus found were fibrous of a loose laminated appearance in part, and granular from 10 to 30 per cent. in different sections. The size of the granular facets averaged from ″.03 to ″.04 diameter, the maximum being ″.06 diameter.

The tensile test pieces showed fibrous metal and generally free from granulation.

The muck bar had a higher elastic limit, and lower tensile strength, and less elongation than the axles. The moduli of elasticity of the two are almost identical.

Between loads of 15,000 and 25,000 pounds per square inch the muck bar had a modulus of elasticity of 29,400,000 pounds; the axles (average of all specimens between 5,000 and 20,000 pounds per square inch) was 29,367,000 pounds. Individually the axles showed the modulus of elasticity to be substantially the same in each.

Specimens taken from the middle of the length of each axle showed a higher elastic limit, greater contraction of area, but practically the same tensile strength and elongation as the end specimens.

There are two specimens which were not broken. After passing the maximum load, and while local contraction was going on, the tests were checked and specimens removed from the testing-machine. These bars are reserved for future examination, to determine whether the straining followed by a period of rest will cause a change in the character of the fractured surface.

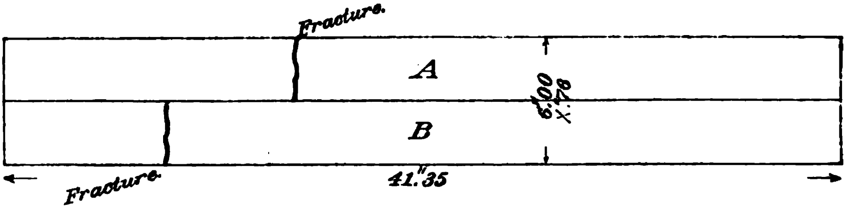
It does not appear from these tests that 95,000 miles run has produced any effect on the quality of the metal.

The remaining axles now in service will be examined at intervals, after completing additional mileage.

Tensile Test of Double-rolled Muck Bar.

Sample of the material from which twelve experimental tender-axles were forged.

Shape of bar.



Specimens A and B obtained by splitting the bar longitudinally in the planer.

No. 538.

Specimen A.

Sectional area, ″2.98 × ″.76 = 2.26 square inch.
Gauged length, 20″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 260	1, 000	0.	0.	0.	0.	Initial load
11, 800	5, 000	.000110	.000110	0.	....	
22, 600	10, 000	.000300	.000190	0.	....	
33, 900	15, 000	.000475	.000175	0.	....	
36, 000	....	.000515	.000040	....	....	
38, 000	....	.000550	.000035	....	....	
40, 000	....	.000585	.000035	....	....	
42, 000	....	.000605	.000020	....	....	
44, 000	....	.000650	.000045	....	....	
45, 200	20, 000	.000600	.000010	.000010	.000010	
46, 000	....	.000680	.000020	....	....	
47, 000	....	.000700	.000020	....	....	
48, 000	....	.000715	.000015	....	....	
40, 000	....	.000735	.000020	....	....	
50, 000	....	.000750	.000015	....	....	
51, 000	....	.000760	.000010	....	....	
52, 000	....	.000785	.000025	....	....	
53, 000	....	.000810	.000025	....	....	
54, 000	....	.000820	.000010	....	....	
55, 000	....	.000860	.000040	....	....	
56, 000	....	.000870	.000010	....	....	
56, 500	25, 000	000900	.000030	.000095	.000085	
57, 000	....	.000945	.000045	....	....	
58, 000	....	.000995	.000050	....	....	
59, 000	26, 110	.001060	.000065	....	....	Elastic limit.
60, 000	....	.001450	.000390	....	....	
61, 000	....	.002050	.000600	....	....	
62, 000	....	.006000	.003950	....	....	
63, 000	....	.011250	.005250	....	....	
64, 000	....	.012550	.001300	....	....	
66, 000	....	.014200	.001650	....	....	
67, 800	30, 000	.016500	.002300	....	....	
70, 060	31, 000	.018300	.001800	....	....	
72, 320	32, 000	.021850	.003550	....	....	
74, 580	33, 000	.025050	.003200	....	....	
76, 840	34, 000	.028250	.003200	....	....	
79, 100	35, 000	.032200	.003950	....	....	
81, 360	36, 000	.036900	.004700	....	....	
83, 620	37, 000	.040900	.004000	....	....	
85, 880	38, 000	.046500	.005600	....	....	
88, 140	39, 000	.0525	.0060	....	....	
90, 400	40, 000	.0590	.0065	....	....	
92, 660	41, 000	.0655	.0065	....	....	
94, 920	42, 000	.0745	.0090	....	....	
97, 180	43, 000	.0850	.0105	....	....	
99, 440	44, 000	.0050	.0100	....	....	
101, 700	45, 000	.1135	.0185	....	....	
103, 960	46, 000	.1425	.0290	....	....	
104, 300	46, 150	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ″.1705.

Elongation of inch sections, ″.18, ″.16, ″.16, ″.16 (″.35 fractured section), ″.16, ″.15, ″.17, ″.16, ″.17, ″.15, ″.15, ″.15, ″.16, ″14, ″.15, ″.15, ″.16, ″.18, ″.20.

Area at fracture, 2″.69 × ″.66 = 1.78 square inch.

Contraction of area, 21.2 per cent.

Appearance of fracture fibrous, lamellar.

No. 539.

Specimen B.

Sectional area, 2″.85 × ″.76 = 2.16 square inches.
Gauged length, 20″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,160	1,000	0.	0.	0.	0.	Initial load.
10,800	5,000	.000140	.000140	0.	....	
21,600	10,000	.000350	.000210	0.	....	
32,400	15,000	.000545	.000195	0.	....	
34,000	....	.000580	.000035	....	....	
36,000	....	.000605	.000025	....	....	
38,000	....	.000645	.000040	....	....	
40,000	....	.000660	.000015	....	....	
42,000	....	.000710	.000050	....	....	
43,200	20,000	.000745	.000035	.000010	.000010	
44,000	....	.000755	.000010	....	....	
45,000	....	.000765	.000010	....	....	
46,000	....	.000785	.000020	....	....	
47,000	....	.000800	.000015	....	....	
48,000	....	.000815	.000015	....	....	
49,000	....	.000840	.000025	....	....	
50,000	....	.000855	.000015	....	....	
51,000	....	.000880	.000025	....	....	
52,000	....	.000900	.000020	....	....	
53,000	....	.000925	.000025	....	....	
54,000	25,000	.000955	.000030	.000060	.000050	
55,000	....	.001000	.000045	....	....	
56,000	25,930	.001045	.000045	....	....	Elastic limit.
57,000	....	.001160	.000115	....	....	
58,000	....	.002150	.000990	....	....	
59,000	....	.007875	.005725	....	....	
60,000	....	.012650	.004775	....	....	
61,000	....	.013660	.001010	....	....	
62,000	....	.014550	.000890	....	....	
63,000	....	.015375	.000825	....	....	
64,000	....	.016900	.001525	....	....	
64,800	30,000	.017950	.001050	....	....	
66,960	31,000	.020225	.002275	....	....	
69,120	32,000	.023690	.003465	....	....	
71,280	33,000	.027000	.003310	....	....	
73,440	34,000	.031100	.004100	....	....	
75,600	35,000	.035150	.004050	....	....	
77,760	36,000	.039210	.004060	....	....	
79,920	37,000	.044500	.005290	....	....	
82,080	38,000	.0500	.0055	....	....	
84,240	39,000	.0565	.0065	....	....	
86,400	40,000	.0640	.0075	....	....	
88,560	41,000	.0725	.0085	....	....	
90,720	42,000	.0840	.0115	....	....	
92,880	43,000	.0965	.0125	....	....	
95,040	44,000	.1115	.0150	....	....	
97,200	45,000	.1425	.0310	....	....	
98,100	45,420	.1675	.0250	....	....	Tensile strength.

Elongation per inch after rupture, ″.1645.
Elongation of inch sections, ″.17, ″.17, ″.16, ″.17, ″.15, ″.17, ″.17, ″.18, ″.19, ″.19, ″.19, ″.17, ″.17, 16, ″.15, ″.15, ″.16, ″.14, ″.13, ″.15.
Area at fracture, 2″.62 × ″.65 = 1.71 square inch.
Contraction of area, 20.8 per cent.
Appearance of fracture fibrous, lamellar.

TENSILE TESTS OF SPECIMENS TAKEN FROM AXLE M. B₁.

No. 1524.

Marks, $\frac{M.\ B_1}{1\ a.}$

Diameter, 1″.129.

Sectional area, 1.00 square inch.

Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	.0001	
20,000	20,000	.0060	.0003	
21,000	21,000	.0071	....	
21,500	21,500	.0077	....	
22,000	22,000	.0082	....	Elastic limit.
22,500	22,500	.0115	....	
23,000	23,000	.0174	....	
23,500	23,500	.0238	....	
24,000	24,000	.0326	....	
24,500	24,500	.0395	....	
25,000	25,000	.0530	.0449	
	5,000	.0462	....	
	10,000	.0480	....	
	15,000	.0497	....	
	20,000	.0516	....	
26,000	26,000	.0704	....	
27,000	27,000	.1045	....	
28,000	28,000	.1312	....	
29,000	29,000	.1662	....	
30,000	30,000	.189	....	
31,000	31,000	.210	....	
32,000	32,000	.256	....	
33,000	33,000	.296	....	
34,000	34,000	.337	....	
35,000	35,000	.378	....	
36,000	36,000	.44	....	
37,000	37,000	.48	....	
38,000	38,000	.54	....	
39,000	39,000	.60	....	
40,000	40,000	.68	....	
41,000	41,000	.75	....	
42,000	42,000	.84	....	
43,000	43,000	.95	....	
44,000	44,000	1.00	....	
45,000	45,000	1.82	....	
45,300	45,300	1.40	....	
45,500	45,500	1.47	....	
45,700	45,700	1.56	....	
46,000	46,000	1.69	....	
46,200	46,200	1.76	....	
46,300	46,300	1.80	....	
46,400	46,400	1.90	....	
46,500	46,500	2.04	....	
46,510	46,510	2.12	....	Tensile strength.
38,500	38,500	....	....	Load at time of rupture.

Elongation after fracture, 2.40 = 24 per cent.

Elongation of inch sections, ″.24, ″.25, ″.23, ″.21, ″.27, ″.50*, ″.23, ″.19, ″.15, ″.13.

Diameter at fracture, ″.91; area, .650 square inch.

Contraction, 35 per cent.

Appearance of fracture fibrous.

No. 1527.

Tension Test.

Marks, $\frac{M.\ B_1}{2\ a}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	Initial load.
1,000	1,000	0.	0.	
5,000	5,000	.0012	0.	
10,000	10,000	.0029	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0066	.0002	
20,500	20,500	.0068	....	
21,000	21,000	.0071	....	
21,500	21,500	.0073	....	
22,000	22,000	.0076	....	
22,500	22,500	.0079	....	
23,000	23,000	.0082	....	
23,500	23,500	.0086	....	Elastic limit.
24,000	24,000	.0092	....	
24,500	24,500	.0110	....	
25,000	25,000	.0222	.143	
26,000	26,000	.0468	....	
27,000	27,000	.0740	....	
28,000	28,000	.0998	....	
29,000	29,000	.126	....	
30,000	30,000	.151	....	
31,000	31,000	.183	....	
32,000	32,000	.217	....	
33,000	33,000	.253	....	
34,000	34,000	.286	....	
35,000	35,000	.327	....	
36,000	36,000	.37	....	
37,000	37,000	.43	....	
38,000	38,000	.50	....	
39,000	39,000	.57	....	
40,000	40,000	.68	....	
41,000	41,000	.75	....	
42,000	42,000	.87	....	
43,000	43,000	1.04	....	
43,500	43,500	1.12	....	
44,000	44,000	1.25	....	
44,500	44,500	1.39	....	
45,000	45,000	1.58	....	
45,200	45,200	1.76	....	
45,220	45,220	1.95	....	Tensile strength.
37,100	37,100	....	....	Load at time of fracture.

Elongation after fracture, 2″.63 = 26.3 per cent.
Elongation of inch sections, ″.16, ″.16, ″.15, ″.14, ″.19, ″.26, ″.33, ″.68*, ″.32, ″.24.
Diameter at fracture, ″.79; area, .490 square inch.
Contraction, 51 per cent.
Appearance of fracture fine fibrous.

No. 1528.

Marks, $\frac{\text{M. B}_1}{\text{2 b}}$
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Gauged length, 10''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0014	0.	
10,000	10,000	.0030	.0001	
15,000	15,000	.0048	.0001	
20,000	20,000	.0066	.0002	
20,500	20,500	.0068	....	
21,000	21,000	.0070	....	
21,500	21,500	.0071	....	
22,000	22,000	.0073	....	
22,500	22,500	.0075	....	
23,000	23,000	.0078	....	
23,500	23,500	.0079	....	
24,000	24,000	.0082*	....	
24,500	24,500	.0086	....	
25,000	25,000	.0089	.0000	
25,500	25,500	.0094	....	Elastic limit.
26,000	26,000	.0168	....	
26,500	26,500	.0239	....	
27,000	27,000	.0315	....	
27,500	27,500	.0375	....	
28,000	28,000	.0541	....	
29,000	29,000	.092	....	
30,000	30,000	.115	....	
31,000	31,000	.143	....	
32,000	32,000	.173	....	
33,000	33,000	.201	....	
34,000	34,000	.237	....	
35,000	35,000	.269	....	
36,000	36,000	.324	....	
37,000	37,000	.367	....	
38,000	38,000	.420	....	
39,000	39,000	.49	....	
40,000	40,000	.55	....	
41,000	41,000	.64	....	
42,000	42,000	.72	....	
43,000	43,000	.82	....	
44,000	44,000	.96	....	
44,500	44,500	1.01	....	
45,000	45,000	1.10	....	
45,500	45,500	1.22	....	
46,000	46,000	1.35	....	
46,500	46,500	1.52	....	
46,980	46,980	1.88	....	Tensile strength.
39,500	39,500	....	....	Load at time of fracture.

Elongation after fracture, 2''.28=22.8 per cent.
Elongation of inch sections, ''.15, ''.15, ''.15, ''.17, ''.24, ''.57*, ''.32, ''.21, ''.16, ''.16.
Diameter at fracture, ''.83; area, .541 square inch.
Contraction, 45.9 per cent.
Appearance of fracture fine, fibrous.

No. 1529.

Marks, $\frac{\text{M B}_1}{20}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0064	.0001	
20,500	20,500	.0067	....	
21,000	21,000	.0068	....	
21,500	21,500	.0070	....	
22,000	22,000	.0072	....	
22,500	22,500	.0074	....	
23,000	23,000	.0076	....	
23,500	23,500	.0079	....	
24,000	24,000	.0081	....	
24,500	24,500	.0084	....	
25,000	25,000	.0087	.0007	Elastic limit.
25,500	25,500	.0098	....	
26,000	26,000	.0269	....	
26,500	26,500	.0362	....	
27,000	27,000	.0622	....	
27,500	27,500	.0780	....	
28,000	28,000	.0971	....	
28,500	28,500	.1070	....	
29,000	29,000	.1157	....	
30,000	30,000	.144	....	
31,000	31,000	.178	....	
32,000	32,000	.208	....	
33,000	33,000	.246	....	
34,000	34,000	.274	....	
35,000	35,000	.322	....	
36,000	36,000	.370	....	
37,000	37,000	.42	....	
38,000	38,000	.48	....	
39,000	39,000	.54	....	
40,000	40,000	.62	....	
41,000	41,000	.70	....	
42,000	42,000	.82	....	
43,000	43,000	.97	....	
44,000	44,000	1.13	....	
45,000	45,000	1.37	....	
45,500	45,500	1.57	....	
45,750	45,750	1.90	....	Tensil strength.
40,000	40,000	....	....	Test discontinued. Bar not fractured.

Total elongation, 2″.23 = 22.3 per cent.
Elongation of inch sections, ″.19, ″.19, ″.21, ″.24, ″.51*, ″.30, ″.16, ″.16, ″.15, ″.12.
Diameter at contracted section, ″.85; area, .567 square inch.
Contraction, 43.3 per cent.
This bar is to be fractured after a period of rest.

No. 1530.

Marks, $^{\text{M. B}_1}_{\text{3 a}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	.0001	
17,000	17,000	.0057	....	
18,000	18,000	.0061	....	
19,000	19,000	.0066	....	
19,500	19,500	.0070	....	Elastic limit.
20,000	20,000	.0124	.0068	
20,500	20,500	.0186	....	
21,000	21,000	.0221	....	
21,500	21,500	.0269	....	
22,000	22,000	.0327	....	
23,000	23,000	.0522	....	
24,000	24,000	.0708	....	
25,000	25,000	.0950	.0860	
26,000	26,000	.1161	....	
27,000	27,000	.1370	....	
28,000	28,000	.1650	....	
29,000	29,000	.189	....	
30,000	30,000	.220	....	
31,000	31,000	.253	....	
32,000	32,000	.287	....	
33,000	33,000	.322	....	
34,000	34,000	.372	....	
35,000	35,000	.41	....	
36,000	36,000	.46	....	
37,000	37,000	.51	....	
38,000	38,000	.58	....	
39,000	39,000	.63	....	
40,000	40,000	.71	....	
41,000	41,000	.80	....	
42,000	42,000	.91	....	
43,000	43,000	1.05	....	
44,000	44,000	1.21	....	
44,500	44,500	1.34	....	
45,000	45,000	1.50	....	
45,500	45,500	1.71	....	
45,700	45,700	2.08	....	Tensile strength.
39,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.67 = 26.7 per cent.

Elongation of inch sections, ″.16, ″.18, ″.23, ″.36, ″.55*, ″.28, ″.26, ″.23, ″.22, ″.20.

Diameter at fracture, ″.85; area, .567 square inch.

Contraction, 43.3 per cent.

Appearance of fracture fibrous, seamy.

No. 1531.

Marks, ${}^{M.\,B_1}_{\;\,3\,b}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0029	—.0001	
15,000	15,000	.0047	—.0001	
18,000	18,000	.0058	....	
18,500	18,500	.0063	....	
19,000	19,000	.0067	....	
19,500	19,500	.0071	....	Elastic limit.
20,000	20,000	.0087	.0025	
20,500	20,500	.0107	....	
21,000	21,000	.0120	....	
21,500	21,500	.0137	....	
22,000	22,000	.0172	....	
22,500	22,500	.0209	....	
23,000	23,000	.0241	....	
23,500	23,500	.0300	....	
24,000	24,000	.0401	....	
25,000	25,000	.0570	.0487	
26,000	26,000	.0841	....	
27,000	27,000	.1050	....	
28,000	28,000	.130	....	
29,000	29,000	.156	....	
30,000	30,000	.184	....	
31,000	31,000	.214	....	
32,000	32,000	.247	....	
33,000	33,000	.282	....	
34,000	34,000	.317	....	
35,000	35,000	.359	....	
36,000	36,000	.41	....	
37,000	37,000	.47	....	
38,000	38,000	.51	....	
39,000	39,000	.58	....	
40,000	40,000	.65	....	
41,000	41,000	.72	....	
42,000	42,000	.82	....	
43,000	43,000	.94	....	
44,000	44,000	1.07	....	
45,000	45,000	1.25	....	
45,500	45,500	1.40	....	
46,000	46,000	1.54	....	
46,500	46,500	1.82	....	
46,590	46,590	2.03	....	Tensile strength.
39,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.31 = 23.1 per cent.

Elongation of inch section, ″.54, ″.21, ″.22, ″.22, ″.20, ″.21, ″.19, ″.18, ″.16, ″.18.

Diameter at fracture, ″.88; area, .608 square inch.

Contraction, 39.2 per cent.

Appearance of fracture fibrous, with traces of granular metal; seamy

No. 1530.

Marks, $\genfrac{}{}{0pt}{}{\text{M. B}_1}{\text{3 a}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	.0001	
17,000	17,000	.0057	....	
18,000	18,000	.0061	....	
19,000	19,000	.0066	....	
19,500	19,500	.0070	....	Elastic limit.
20,000	20,000	.0124	.0068	
20,500	20,500	.0160	....	
21,000	21,000	.0221	....	
21,500	21,500	.0269	....	
22,000	22,000	.0327	....	
23,000	23,000	.0522	....	
24,000	24,000	.0708	....	
25,000	25,000	.0950	.0860	
26,000	26,000	.1161	....	
27,000	27,000	.1370	....	
28,000	28,000	.1650	....	
29,000	29,000	.189	....	
30,000	30,000	.220	....	
31,000	31,000	.253	....	
32,000	32,000	.287	....	
33,000	33,000	.322	....	
34,000	34,000	.372	....	
35,000	35,000	.41	....	
36,000	36,000	.46	....	
37,000	37,000	.51	....	
38,000	38,000	.58	....	
39,000	39,000	.63	....	
40,000	40,000	.71	....	
41,000	41,000	.80	....	
42,000	42,000	.91	....	
43,000	43,000	1.05	....	
44,000	44,000	1.21	....	
44,500	44,500	1.34	....	
45,000	45,000	1.50	....	
45,500	45,500	1.71	....	
45,700	45,700	2.08	....	Tensile strength.
39,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.67 = 26.7 per cent.

Elongation of inch sections, ″.16, ″.18, ″.23, ″.36, ″.55*, ″.28, ″.26, ″.23, ″.22, ″.20.

Diameter at fracture, ″.85; area, .567 square inch.

Contraction, 43.3 per cent.

Appearance of fracture fibrous, seamy.

TENSILE TESTS OF SPECIMENS TAKEN FROM AXLE M B₂.

No. 1533.

Marks, $\frac{\text{M B}_2}{\text{1 a}}$.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0067	.0004	
20,500	20,500	.0071	....	
21,000	21,000	.0076	....	
21,500	21,500	.0078	....	
22,000	22,000	.0083	....	Elastic limit.
22,500	22,500	.0091	....	
23,000	23,000	.0098	....	
23,500	23,500	.0122	....	
24,000	24,000	.0164	....	
24,500	24,500	.0187	....	
25,000	25,000	.0234	.0155	
26,000	26,000	.0448	....	
27,000	27,000	.0635	....	
28,000	28,000	.0850	....	
29,000	29,000	.1138	....	
30,000	30,000	.1425	....	
31,000	31,000	.172	....	
32,000	32,000	.201	....	
33,000	33,000	.235	....	
34,000	34,000	.270	....	
35,000	35,000	.305	....	
36,000	36,000	.350	....	
37,000	37,000	.40	....	
38,000	38,000	.45	....	
39,000	39,000	.51	....	
40,000	40,000	.56	....	
41,000	41,000	.63	....	
42,000	42,000	.71	....	
43,000	43,000	.80	....	
44,000	44,000	.90	....	
45,000	45,000	1.02	....	
46,000	46,000	1.19	....	
46,500	46,500	1.31	....	
47,000	47,000	1.45	....	
47,500	47,500	1.62	....	
48,000	48,000	1.92	....	
48,160	48,160	2.12	....	Tensile strength.
39,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.55 = 25.5 per cent.

Elongation of inch section, ″.18, ″.20, ″.20, ″.27, ″.47*, ″.33, ″.24, ″.22, ″.22, ″.22.

Diameter at fracture, ″.88; area, .608 square inch.

Contraction, 39.2 per cent.

Appearance of fracture fibrous; small spot of granular metal.

No. 1534.

Marks, $\substack{\text{M. B}_2 \\ \text{1 b}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	.0001	
20,000	20,000	.0068	.0004	
21,000	21,000	.0073	....	Elastic limit.
21,500	21,500	.0082	....	
22,000	22,000	.0095	....	
22,500	22,500	.0137	....	
23,000	23,000	.0171	....	
23,500	23,500	.0205	....	
24,000	24,000	.0228	....	
24,500	24,500	.0280	....	
25,000	25,000	.0424	.0349	
26,000	26,000	.0570	....	
27,000	27,000	.0810	....	
28,000	28,000	.107	....	
29,000	29,000	.140	....	
30,000	30,000	.164	....	
31,000	31,000	.193	....	
32,000	32,000	.222	....	
33,000	33,000	.255	....	
34,000	34,000	.294	....	
35,000	35,000	.330	....	
36,000	36,000	.39	....	
37,000	37,000	.42	....	
38,000	38,000	.48	....	
39,000	39,000	.53	....	
40,000	40,000	.60	....	
41,000	41,000	.67	....	
42,000	42,000	.75	....	
43,000	43,000	.85	....	
44,000	44,000	.97	....	
45,000	45,000	1.11	....	
45,500	45,500	1.20	....	
46,000	46,000	1.33	....	
46,500	46,500	1.51	....	
47,000	47,000	1.76	....	
47,260	47,260	2.12	....	Tensile strength.
32,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.32 = 23.2 per cent
Elongation of inch sections, ″.18, ″.19, ″.43*, ″.23, ″.21, ″.23, ″.21, ″.21, ″.22, ″.21.
Diameter at fracture, ″.98; area, .754 square inch.
Contraction, 24.6 per cent.
Appearance of fracture fibrous, seamy.

No. 1535.

Marks, $\frac{\text{M. B}_2}{1\ \text{c}}$.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0015	.0002	
10,000	10,000	.0032	.0002	
15,000	15,000	.0050	.0003	
20,000	20,000	.0068	.0004	
21,000	21,000	.0073	....	
21,500	21,500	.0078	....	
22,000	22,000	.0081	....	
22,500	22,500	.0089	....	Elastic limit.
23,000	23,000	.0165	....	
23,500	23,500	.0200	....	
24,000	24,000	.0261	....	
24,500	24,500	.0312	....	
25,000	25,000	.0379	.0297	
26,000	26,000	.0618	....	
27,000	27,000	.0840	....	
28,000	28,000	.118	....	
29,000	29,000	.140	....	
30,000	30,000	.168	....	
31,000	31,000	.195	....	
32,000	32,000	.225	....	
33,000	33,000	.258	....	
34,000	34,000	.297	....	
35,000	35,000	.337	....	
36,000	36,000	.40	....	
37,000	37,000	.44	....	
38,000	38,000	.49	....	
39,000	39,000	.54	....	
40,000	40,000	.61	....	
41,000	41,000	.69	....	
42,000	42,000	.78	....	
43,000	43,000	.87	....	
44,000	44,000	1.00	....	
44,500	44,500	1.08	....	
45,000	45,000	1.18	....	
45,500	45,500	1.30	....	
46,000	46,000	1.42	....	
46,500	46,500	1.61	....	
46,890	46,890	2.04	....	Tensile strength.
41,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.38 = 23.8 per cent.

Elongation of inch sections, ″.21, ″.23, ″.29, ″.48*, ″.26, ″.20, ″.26, ″.18, ″.14, ″.13.

Diameter at fracture, ″.89; area, .622 square inch.

Contraction, 37.8 per cent.

Appearance of fracture fibrous, seamy.

No. 1536.

Marks, $\frac{M. B_2}{2 a}$
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Gauged length, 10''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0045	—.0002	
20,000	20,000	.0062	—.0002	
21,000	21,000	.0066		
21,500	21,500	.0068		
22,000	22,000	.0071		
22,500	22,500	.0073		
23,000	23,000	.0074		
23,500	23,500	.0076		
24,000	24,000	.0078		
24,500	24,500	.0082		
25,000	25,000	.0085	.0004	
25,500	25,500	.0089		Elastic limit.
26,000	26,000	.0098		
26,500	26,500	.0114		
27,000	27,000	.0149		
27,500	27,500	.0302		
28,000	28,000	.0402		
29,000	29,000	.0580		
30,000	30,000	.084		
31,000	31,000	.111		
32,000	32,000	.141		
33,000	33,000	.167		
34,000	34,000	.199		
35,000	35,000	.235		
36,000	36,000	.274		
37,000	37,000	.322		
38,000	38,000	.371		
39,000	39,000	.44		
40,000	40,000	.51		
41,000	41,000	.58		
42,000	42,000	.66		
43,000	43,000	.76		
44,000	44,000	.88		
45,000	45,000	1.04		
45,500	45,500	1.17		
46,000	46,000	1.30		
46,500	46,500	1.48		
47,000	47,000	1.81		
47,050	47,050	2.10		Tensile strength.
39,500	39,500			Load at time of fracture.

Elongation after fracture, 2''.59 = 25.9 per cent.

Elongation of inch sections, ''.41, ''.55*, ''.23, ''.21, ''.21, ''.19, ''.20, ''.20, ''.19.

Diameter at fracture, .''83; area, .541 square inch.

Contraction, 45.9 per cent.

Appearance of fracture fine, fibrous.

No. 1537.

Marks, $^{M.B.}_{2b}$
Diameter, 1″.129.
Sectional area, 1.00 per square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inches.*	
1,000	1,000	0.	.0	Initial load.
5,000	5,000	.0013	.0	
10,000	10,000	.0030	.0	
15,000	15,000	.0048	.0	
20,000	20,000	.0066	.0001	
22,000	22,000	.0075	....	
23,000	23,000	.0079	....	
23,500	23,500	.0084	....	
24,000	24,000	.0088	....	Elastic limit.
24,500	24,500	.0102	....	
25,000	25,000	.0121	.0038	
25,500	25,500	.0168	....	
26,000	26,000	.0232	....	
26,500	26,500	.0330	....	
27,000	27,000	.0448	....	
28,000	28,000	.0645	....	
29,000	29,000	.0900	....	
30,000	30,000	.0115	....	
31,000	31,000	.0145	....	
32,000	32,000	.0174	....	
33,000	33,000	.0207	....	
34,000	34,000	.0240	....	
35,000	35,000	.0283	....	
36,000	36,000	.0327	....	
37,000	37,000	.39	....	
38,000	38,000	.44	....	
39,000	39,000	.50	....	
40,000	40,000	.56	....	
41,000	41,000	.65	....	
42,000	42,000	.75	....	
43,000	43,000	.85	....	
44,000	44,000	1.01	....	
44,500	44,500	1.11	....	
45,000	45,000	1.23	....	
45,500	45,500	1.41	....	
46,000	46,000	1.65	....	
46,280	46,280	2.01	....	Tensile strength.
39,000	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.57 = 25.7 per cent.

Elongation of inch sections, ″.27, ″.66*, ″.29, ″.23, ″.23, ″.22, ″.18, ″.17, ″.16, ″.16.

Diameter at fracture, ″.77; area, ″.466 square inch.

Contraction, 53.4 per cent.

Appearance of fracture fine, fibrous.

No. 1538.

Marks, $\genfrac{}{}{0pt}{}{\text{M. B}_2}{20}$.
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0011	—.0001	
10,000	10,000	.0028	—.0001	
15,000	15,000	.0048	—.0001	
20,000	20,000	.0066	0.	
22,000	22,000	.0074	....	
22,500	22,500	.0077	....	
23,000	23,000	.0079	....	
23,500	23,500	.0081	....	
24,000	24,000	.0083	....	
24,500	24,500	.0087	....	
25,000	25,000	.0093	.0010	
25,500	25,500	.0098	....	Elastic limit.
26,000	26,000	.0111	....	
26,500	26,500	.0132	....	
27,000	27,000	.0161	....	
27,500	27,500	.0224	....	
28,000	28,000	.0331	....	
29,000	29,000	.0510	....	
30,000	30,000	.0722	....	
31,000	31,000	.0992	....	
32,000	32,000	.123	....	
33,000	33,000	.155	....	
34,000	34,000	.185	....	
35,000	35,000	.220	....	
36,000	36,000	.256	....	
37,000	37,000	.297	....	
38,000	38,000	.345	....	
39,000	39,000	.42	....	
40,000	40,000	.46	....	
41,000	41,000	.53	....	
42,000	42,000	.60	....	
43,000	43,000	.69	....	
44,000	44,000	.81	....	
45,000	45,000	.93	....	
45,500	45,500	1.03	....	
46,000	46,000	1.15	....	
46,500	46,500	1.30	....	
47,000	47,000	1.52	....	
47,120	47,120	1.80	....	Tensile strength.
44,000	....	....	....	Test discontinued. Bar not fractured.

Total elongation, 1″.97=19.7 per cent.
Elongation of inch sections, ″.44,* ″.25, ″.19, ″.18, ″.17, ″.16, ″.15, ″.14, ″.15, ″.14.
Diameter at contracted section, ″.93; area, .679 square inch.
Contraction, 32.1 per cent.

No. 1539

Marks, $^{\text{M. B}_2}_{\text{8 a}}$
Diameter 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0066	0.	
22,000	22,000	.0079	....	Elastic limit.
22,500	22,500	.0108	....	
23,000	23,000	.0139	....	
23,500	23,500	.0168	....	
24,000	24,000	.0207	....	
24,500	24,500	.0281	....	
25,000	25,000	.0418	0.834	
26,000	26,000	.0612	....	
27,000	27,000	.0873	....	
28,000	28,000	.1187	....	
29,000	29,000	.140	....	
30,000	30,000	.162	....	
31,000	31,000	.184	....	
32,000	32,000	.220	....	
33,000	33,000	.246	....	
34,000	34,000	.294	....	
35,000	35,000	.331	....	
36,000	36,000	.38	....	
37,000	37,000	.41	....	
38,000	38,000	.45	....	
39,000	39,000	.53	....	
40,000	40,000	.58	....	
41,000	41,000	.64	....	
42,000	42,000	.72	....	
43,000	43,000	.81	....	
44,000	44,000	.92	....	
45,000	45,000	1.04	....	
46,000	46,000	1.27	....	
46,500	46,500	1.38	....	
47,000	47,000	1.55	....	
47,500	47,500	1.87	....	
47,660	47,660	2.18	....	Tensile strength.
42,500	....	....	....	Load at time of fracture.

Elongation after fracture 2″.50 = 25.0 per cent.

Elongation of inch sections, ″.25, ″.21, ″.26, ″.49*, ″.25, ″.21, ″.21, ″.26, ″.23, ″.13.

Diameter at fracture, ″.90; area, .636 square inch.

Contraction, 36.4 per cent.

Appearance of fracture fibrous, 95 per cent.; granular, 5 per cent.

No. 1540.

Marks, $\overset{M.\ B_2}{8\,b}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0066	.0002	
21,000	21,000	.0071	....	
21,500	21,500	.0077	....	Elastic limit.
22,000	22,000	.0091	....	
22,500	22,500	.0114	....	
23,000	23,000	.0147	....	
23,500	23,500	.0182	....	
24,000	24,000	.0242	....	
24,500	24,500	.0305	....	
25,000	25,000	.0381	.0303	
26,000	26,000	.0645	....	
27,000	27,000	.0880	....	
28,000	28,000	.118	....	
29,000	29,000	.145	....	
30,000	30,000	.175	....	
31,000	31,000	.205	....	
32,000	32,000	.234	....	
33,000	33,000	.270	....	
34,000	34,000	.308	....	
35,000	35,000	.36	....	
36,000	36,000	.41	....	
37,000	37,000	.45	....	
38,000	38,000	.51	....	
39,000	39,000	.58	....	
40,000	40,000	.64	....	
41,000	41,000	.72	....	
42,000	42,000	.80	....	
43,000	43,000	.90	....	
44,000	44,000	1.06	....	
45,000	45,000	1.24?	....	
45,500	45,500	1.33	....	
46,000	46,000	1.48	....	
46,500	46,500	1.63	....	
47,000	47,000	1.97	....	
47,020	47,020	2.09	....	Tensile strength.
42,800	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.40 = 24.0 per cent.

Elongation of inch sections, ″.17, ″.16, ″.19, ″.33, ″.47, ″.22, ″.22, ″.24, ″.21, ″.19.

Diameter at fracture, ″.88; area, .608 square inch.

Contraction, 39.2 per cent.

Appearance of fracture fibrous, seamy.

No. 1541.

Marks, $\overset{\text{M. B}_3}{\text{3 c}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	.0001	
15,000	15,000	.0049	.0001	
20,000	20,000	.0066	.0001	
21,000	21,000	.0071	....	
21,500	21,500	.0077	....	Elastic limit.
22,000	22,000	.0094	....	
22,500	22,500	.0139	....	
23,000	23,000	.0185	....	
23,500	23,500	.0240	....	
24,000	24,000	.0292	....	
24,500	24,500	.0352	....	
25,000	25,000	.0484	.0402	
26,000	26,000	.0730	....	
27,000	27,000	.0968	....	
28,000	28,000	.122	....	
29,000	29,000	.150	....	
30,000	30,000	.179	....	
31,000	31,000	.209	....	
32,000	32,000	.240	....	
33,000	33,000	.274	....	
34,000	34,000	.307	....	
35,000	35,000	.36	....	
36,000	36,000	.40	....	
37,000	37,000	.44	....	
38,000	38,000	.50	....	
39,000	39,000	.55	....	
40,000	40,000	.62	....	
41,000	41,000	.69	....	
42,000	42,000	.78	....	
43,000	43,000	.88	....	
44,000	44,000	1.00	....	
45,000	45,000	1.17	....	
45,500	45,500	1.27	....	
46,000	46,000	1.40	....	
46,500	46,500	1.55	....	
47,000	47,000	1.83	....	
47,175	47,175	2.24	....	Tensile strength.
41,200	....	....	....	Load at time of fracture.

Elongation after fracture, 2″.81=28.1 per cent.

Elongation of inch sections, ″.18, ″.19, ″.21, ″.35, ″.58, ″.27, ″.25, ″.27, ″.26, ″.25.

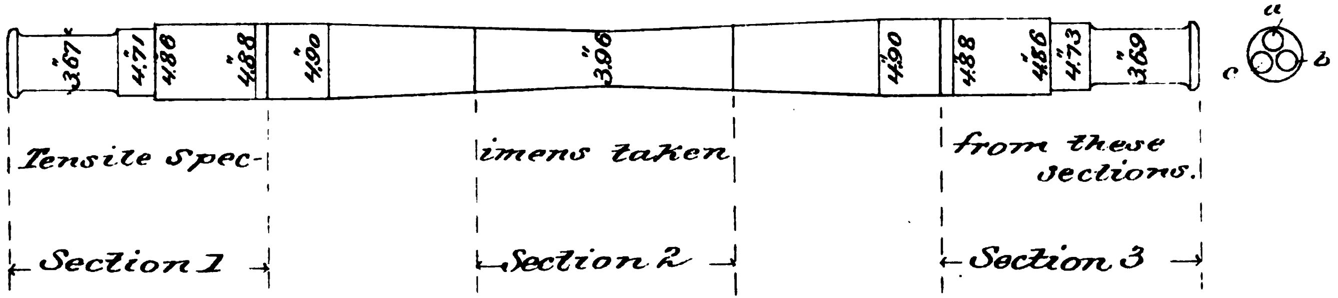
Diameter at fracture, ″.83; area, .541 square inch.

Contraction, 45.9 per cent.

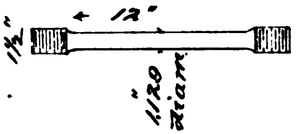
Appearance of fracture fibrous, with traces of granular metal.

Axle M.B. 3

Showing location of specimens, and actual dimensions of axle after 95.000 miles run.



Tensile specimen



TENSILE TESTS OF SPECIMENS TAKEN FROM AXLE M. B $_3$.

No. 1542.

Marks, $^{M\ B_3}_{1\ a}$

Diameter, 1″.129.

Sectional area, 1.00 square inch.

Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0012	0.	
10,000	10,000	0029	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0064	0.	
22,000	22,000	.0079	....	Elastic limit.
22,500	22,500	{ .0083	....	
		.0108	....	
23,000	23,000	.0238	....	
23,500	23,500	.0282	....	
24,000	24,000	.0360	....	
25,000	25,000	.0561	.0473	
26,000	26,000	.0730	....	
27,000	27,000	.0920	....	
28,000	28,000	.1160	....	
29,000	29,000	.1425	....	
30,000	30,000	.1650	....	
31,000	31,000	.1920	....	
32,000	32,000	.2215	....	
33,000	33,000	.2590	....	
34,000	34,000	.2935	....	
35,000	35,000	.3350	....	
36,000	36,000	.38	....	
37,000	37,000	.44	....	
38,000	38,000	.49	....	
39,000	39,000	.54	....	
40,000	40,000	.64	....	
41,000	41,000	.70	....	
42,000	42,000	.78	....	
43,000	43,000	.89	....	
44,000	44,000	.104	....	
44,500	44,500	1.11	....	
45,000	45,000	1.22	....	
45,500	45,500	1.38	....	
46,000	46,000	1.56	....	
46,220	46,220	1.93	....	Tensile strength.
40,200	40,200	....	....	Load at time of fracture.

Elongation after fracture, 2″.22 = 22.2 per cent.

Elongation of inch sections, ″.22, ″.27, ″.58*, ″.27, ″.19, ″.15, ″.14, ″.13, ″.14, ″.13.

Diameter at fracture, ″.88; Area, .608 square inch.

Contraction, 39.2 per cent.

Fractured 7½″ from outer end of specimen. Appearance fibrous.

No. 1543.

Marks, $^{\text{M}\ \text{B}_5}_{1\ \text{b}}$
Diameter, 1.″129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0066	.0003	
22,000	22,000	.0077	....	Elastic limit.
22,500	22,500	.0083 .0097	....	
23,000	23,000	.0184	....	
23,500	23,500	.0315	....	
24,000	24,000	.0398	....	
24,500	24,500	.0452	....	
25,000	25,000	.0553	.0468	
26,000	26,000	.0695	....	
27,000	27,000	.1008	....	
28,000	28,000	.1220	....	
29,000	29,000	.1510	....	
30,000	30,000	.1765	....	
31,000	31,000	.2122	....	
32,000	32,000	.2380	....	
33,000	33,000	.2630	....	
34,000	34,000	.3120	....	
35,000	35,000	.36	....	
36,000	36,000	.41	....	
37,000	37,000	.47	....	
38,000	38,000	.51	....	
39,000	39,000	.56	....	
40,000	40,000	.62	....	
41,000	41,000	.73	....	
42,000	42,000	.82	....	
43,000	43,000	.93	....	
44,000	44,000	.103	....	
44,500	44,500	.116	....	
45,000	45,000	.129	....	
45,500	45,500	.144	....	
46,000	46,000	.166	....	
46,100	46,100	.190	....	Tensile strength.
40,200	40,200	....	....	Load at time of fracture.

Elongation after fracture, 2″.28 = 22.8 per cent.

Elongation of inch sections, ″.32, ″.64*, ″.25, ″.21, ″.16, ″.15, ″.15, ″.13, ″.13, ″.14.

Diameter at fracture, ″.84; area, .554 square inch.

Contraction, 44.6.

Fractured, 6″.3 from outer end of specimen; appearance fibrous.

No. 1544.

Marks, $\overset{M\ B_3}{10}$

Diameter, ″.129.

Sectional area, 1.00 square inch.

Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation	Elongation set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0029	0.	
15,000	15,000	.0046	0.	
20,000	20,000	.0065	0.	
21,000	21,000	.0072	....	
21,500	21,500	.0076	....	Elastic limit.
22,000	22,000	.0087	....	
22,500	22,500	.0103	....	
23,000	23,000	.0253	....	
23,500	23,500	.0370	....	
24,000	24,000	.0495	....	
25,000	25,000	.0690	.0600	
26,000	26,000	.0870	....	
27,000	27,000	.1120	....	
28,000	28,000	.1320	....	
29,000	29,000	.1600	....	
30,000	30,000	.1905	....	
31,000	31,000	.2160	....	
32,000	32,000	.2570	....	
33,000	33,000	.2820	....	
34,000	34,000	.3220	....	
35,000	35,000	.37	....	
36,000	36,000	.42	....	
37,000	37,000	.46	....	
38,000	38,000	.51	....	
39,000	39,000	.58	....	
40,000	40,000	.64	....	
41,000	41,000	.72	....	
42,000	42,000	.81	....	
43,000	43,000	.92	....	
44,000	44,000	1.06	....	
44,500	44,500	1.17	....	
45,000	45,000	1.30	....	
45,500	45,500	1.43	....	
46,000	46,000	1.69	....	
46,080	46,080	1.82	....	Tensile strength.

Elongation after fracture, 2″.16 = 21.6 per cent.

Elongation of inch sections, ″.59*, ″.31, ″.23, ″.17, ″.17, ″.14, ″.15, ″.13, ″.14, ″.13.

Diameter at fracture, ″.83; area, ″.541 square inch.

Contraction, 45.9 per cent.

Fractured 5″.4 from outer end of specimen. Appearance fibrous, seamy.

No. 1545.

Marks, $^{\mathrm{M\,B_3}}_{\mathrm{2\,a}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0012	0.	
10,000	10,000	.0028	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0066	.0002	
21,000	21,000	.0071	....	
21,500	21,500	.0073	....	
22,000	22,000	.0076	....	
22,500	22,500	.0078	....	
23,000	23,000	.0081	....	
23,500	23,500	.0087	....	
24,000	24,000	.0090	....	
24,500	24,500	.0093	....	
25,000	25,000	.0097	.0016	Elastic limit.
25,500	25,500	.0104	....	
26,000	26.000	.0114	....	
26,500	26,500	.0133	....	
27,000	27,000	.0172	....	
27,500	27.500	.0200	....	
28,000	28,000	.0223	....	
28,500	28,500	.0271	....	
29,000	29,000	.0318	....	
29,500	29,500	.0379	....	
30,000	30,000	.0475	....	
31,000	31.000	.0712	....	
32,000	32.000	.0806	....	
33,000	33,000	.1120	....	
34,000	34,000	.1430	....	
35,000	35,000	.1725	....	
36,000	36,000	.2040	....	
37,000	37,000	.2400	....	
38,000	38,000	.29	....	
39,000	39,000	.33	....	
40,000	40,000	.38	....	
41,000	41,000	.42	....	
42,000	42,000	.50	....	
43,000	43,000	.57	....	
44,000	44,000	.65	....	
45,000	45,000	.85	....	
46,000	46,000	.89	....	
47,000	47,000	1.07	....	
48,000	48,000	1.32	....	
48,500	48,500	1.53	....	
48,890	48,890	1.97	....	Tensile strength.
40,500	40,500	....	....	Load at time of fracture.

Elongation after fracture, 2″.52 = 25.2 per cent.

Elongation of inch sections, ″.18, ″.25, ″.63,* ″.28, ″.23, ″.22, ″.19, ″.18, ″.19, ″.17.

Diameter at fracture, ″.82; area, .528 square inch.

Contraction, 47.2 per cent.

Appearance of fracture fibrous.

No. 1546.

Marks, $^{M\ B_3}_{2\ b}$

Diameter, ″1.129.

Sectional area, 1.00 square inch.

Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0066	.0001	
21,000	21,000	.0070	....	
21,500	21,500	.0072	....	
22,000	22,000	.0074	....	
22,500	22,500	.0075	....	
23,000	23,000	.0076	....	
23,500	23,500	.0078	....	
24,000	24,000	.0080	....	
24,500	24,500	.0082	....	
25,000	25,000	.0083	.0002	
25,500	25,500	.0086	....	
26,000	26,000	.0088	....	
26,500	26,500	.0090	....	
27,000	27,000	.0092	....	
27,500	27,500	.0093	....	
28,000	28,000	.0095	....	
28,500	28,500	.0098	....	
29,000	29,000	.0102	....	
29,500	29,500	.0106	....	Elastic limit.
30,000	30,000	.0200	....	
31,000	31,000	.0390	....	
32,000	32,000	.0875	....	
33,000	33,000	.1168	....	
34,000	34,000	.1500	....	
35,000	35,000	.1725	....	
36,000	36,000	.2050	....	
37,000	37,000	.2560	....	
38,000	38,000	.28	....	
39,000	39,000	.34	....	
40,000	40,000	.40	....	
41,000	41,000	.44	....	
42,000	42,000	.53	....	
43,000	43,000	.61	....	
44,000	44,000	.72	....	
45,000	45,000	.82	....	
46,000	46,000	.98	....	
47,000	47,000	1.19	....	
48,000	48,000	1.57	....	
48,140	48,140	1.90	....	Tensile strength.
42,200	42,200	....	....	Load at time of fracture.

Elongation after fracture, 2″.27 = 22.7 per cent.

Elongation of inch sections, ″.17, ″.30, ″.55*, ″.21, ″.20, ″.19, ″.18 ″.16, ″.17, ″.14.

Diameter at fracture, ″.84; area, .554 square inch.

Contraction, 44.6 per cent.

Appearance of fracture fibrous.

No. 1547.

Marks, $^{\text{M B}_3}_{\text{2 o}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0048	0.	
20,000	20,000	.0066	.0001	
21,000	21,000	.0071	....	
21,500	21,500	.0074	....	
22,000	22,000	.0077	....	
22,500	22,500	.0079	....	
23,000	23,000	.0082	....	
23,500	23,500	.0085	....	
24,000	24,000	.0087	....	Elastic limit.
24,500	24,500	.0094	....	
25,000	25,000	.0117	.0034	
25,500	25,500	.0139	....	
26,000	26,000	.0178	....	
26,500	26,500	.0212	....	
27,000	27,000	.0250	....	
28,000	28,000	.0330	....	
29,000	29,000	.0470	....	
30,000	30,000	.0670	....	
31,000	31,000	.0925	....	
32,000	32,000	.1170	....	
33,000	33,000	.1460	....	
34,000	34,000	.1730	....	
35,000	35,000	.2100	....	
36,000	36,000	.2400	....	
37,000	37,000	.2780	....	
38,000	38,000	.3275	....	
39,000	39,000	.40	....	
40,000	40,000	.45	....	
41,000	41,000	.51	....	
42,000	42,000	.58	....	
43,000	43,000	.67	....	
44,000	44,000	.78	....	
45,000	45,000	.92	....	
46,000	46,000	1.09	....	
46,500	46,500	1.21	....	
47,000	47,000	1.39	....	
47,500	47,500	1.62	....	
47,750	47,750	1.93	....	Tensile strength.
40,800	40,800	....	....	Load at time of fracture.

Elongation after fracture, 2″.44 = 24.4 per cent.

Elongation of inch sections, ″.21, ″.23, ″.56*, ″.38, ″.22, ″.20, ″.19, ″.18, ″.15, ″.12.

Diameter at fracture, ″.83; area, .541 square inch.

Contraction, .945 per cent.

Appearance of fracture fibrous.

No. 1548.

Marks, $\genfrac{}{}{0pt}{}{\mathrm{M\ B_1}}{\mathrm{3\ a}}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0030	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0064	.0001	
21,000	21,000	.0067	....	
21,500	21,500	.0069	....	Elastic limit.
22,000	22,000	.0076	....	
22,500	22,500	.0082	....	
23,000	23,000	.0112	....	
23,500	23,500	.0148	....	
24,000	24,000	.0237	....	
25,000	25,000	.0528	....	
26,000	26,000	.0750	....	
27,000	27,000	.0965	....	
28,000	28,000	.1145	....	
29,000	29,000	.1390	....	
30,000	30,000	.1680	....	
31,000	31,000	.1920	....	
32,000	32,000	.2220	....	
33,000	33,000	.2550	....	
34,000	34,000	.2920	....	
35,000	35,000	.3300	....	
36,000	36,000	.38	....	
37,000	37,000	.43	....	
38,000	38,000	.48	....	
39,000	39,000	.53	....	
40,000	40,000	.60	....	
41,000	41,000	.67	....	
42,000	42,000	.75	....	
43,000	43,000	.84	....	
44,000	44,000	.95	....	
45,000	45,000	.110	....	
46,000	46,000	.132	....	
46,500	46,500	.147	....	
47,000	47,000	.170	....	
47,360	47,360	.201	....	Tensile strength.

Elongation after fracture, 2″.37 = 23.7 per cent.

Elongation of inch sections, ″.17, ″.18, ″.18, ″.20, ″.22, ″.51*, ″.28, ″.23, ″.22, ″.17.

Diameter at fracture, ″.88; area, .608 square inch.

Contraction, 39.2 per cent.

Fractured, 9″.70 from outer end of specimen. Appearance fibrous, 90 per cent.; granular, 10 per cent.

No. 1549.

Marks, $^{M\,B_3}_{8\,b}$
Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0014	.0001	
10,000	10,000	.0031	.0002	
15,000	15,000	.0049	.0002	
20,000	20,000	.0066	.0003	
20,500	20,500	.0070	....	
21,000	21,000	.0073	....	
21,500	21,500	.0077	....	
22,000	22,000	.0082	....	Elastic limit.
22,500	22,500	.0093	....	
23,000	23,000	.0128	....	
23,500	23,500	.0200	....	
24,000	24,000	.0300	....	
25,000	25,000	.0570	....	
26,000	26,000	.0725	....	
27,000	27,000	.0975	....	
28,000	28,000	.1230	....	
29,000	29,000	.1520	....	
30,000	30,000	.1800	....	
31,000	31,000	.2150	....	
32,000	32,000	.2425	....	
33,000	33,000	.2770	....	
34,000	34,000	.3160	....	
35,000	35,000	.37	....	
36,000	36,000	.42	....	
37,000	37,000	.46	....	
38,000	38,000	.52	....	
39,000	39,000	.57	....	
40,000	40,000	.64	....	
41,000	41,000	.72	....	
42,000	42,000	.82	....	
43,000	43,000	.92	....	
44,000	44,000	1.08	....	
45,000	45,000	1.28	....	
45,500	45,500	1.44	....	
46,000	46,000	1.68	....	
46,300	46,300	1.98	....	Tensile strength.
41,100	41,100	....	....	Load at time of rupture.

Elongation after fracture, 2″.35 = 23.5 per cent.

Elongation of inch sections, ″.15, ″.16, ″.17, ″.15, ″.17, ″.21, ″.53*, ″.33, ″.24, ″.24.

Diameter at fracture, ″.87; area, .594 square inch.

Contraction, 40.6.

Fractured 8″.5 from outer end of specimen. Appearance fibrous.

No. 1550.

Marks, $^{\text{M Be}}_{\text{8 c}}$
Diameter, 1''.129.
Sectional area, 1.00 square inch.
Gauged length, 10''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
5,000	5,000	.0013	0.	
10,000	10,000	.0029	0.	
15,000	15,000	.0047	0.	
20,000	20,000	.0065	.0001	
20,500	20,500	.0068	....	
21,000	21,000	.0070	....	
21,500	21,500	.0073	....	
22,000	22,000	.0076	....	Elastic limit.
22,500	22,500	.0093	....	
23,000	23,000	.0112	....	
23,500	23,500	.0150	....	
24,000	24,000	.0260	....	
24,500	24,500	.0360	....	
25,000	25,000	.0508	....	
26,000	26,000	.0780	....	
27,000	27,000	.1025	....	
28,000	28,000	.1300	....	
29,000	29,000	.1600	....	
30,000	30,000	.1875	....	
31,000	31,000	.2150	....	
32,000	32,000	.2485	....	
33,000	33,000	.2850	....	
34,000	34,000	.3300	....	
35,000	35,000	.38	....	
36,000	36,000	.43	....	
37,000	37,000	.48	....	
38,000	38,000	.53	....	
39,000	39,000	.61	....	
40,000	40,000	.69	....	
41,000	41,000	.77	....	
42,000	42,000	.89	....	
43,000	43,000	1.01	....	
44,000	44,000	1.19	....	
45,000	45,000	1.43	....	
45,500	45,500	1.69	....	
45,620	45,620	1.90	....	Tensile strength.

Elongation after fracture, 2''.03 = 20.3 per cent.

Elongation of inch sections, ''.16, ''.17, ''.16, ''.17, ''.20, ''.25, ''.36*, ''.18, ''.19, ''.19.

Diameter at fracture, ''.96; area, .724 square inch.

Contraction, 27.6 per cent.

Fractured 8''.9 from outer end of specimen. Appearance fibrous, spongy; contains cinder.

TABULATION OF SPECIMENS CUT FROM TENDER-AXLE WHICH HAD BEEN RUN 95,000 MILES.

No. of test.	Marks.	Length of stem.	Diameter.	Sectional area.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 10″.	Contraction of area.	Appearance of fracture.
		Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Per cent.*	*Per cent.*	
1542	M B_3 1 a	12	1.129	1.00	22,000	46,220	22.2	39.2	Fibrous.
1543	M B_3 1 b	12	1.129	1.00	22,000	46,100	22.8	44.6	Fibrous.
1544	M B_3 1 c	12	1.129	1.00	21,500	46,080	21.6	45.9	Fibrous, seamy.
1545	M B_3 2 a	12	1.129	1.00	25,600	48,890	25.2	47.2	Fibrous.
1546	M B_3 2 b	12	1.129	1.00	29,500	48,140	22.7	44.6	Fibrous.
1547	M B_3 2 c	12	1.129	1.00	24,000	47,750	24.4	45.9	Fibrous.
1548	M B_3 3 a	12	1.129	1.00	21,500	47,360	23.7	39.2	Fibrous 90 per cent., granular 10 per cent.
1549	M B_3 3 b	12	1.129	1.00	22,000	46,300	23.5	40.6	Fibrous.
1550	M B_3 3 c	12	1.129	1.00	22,000	45,620	20.3	27.6	Fibrous, spongy; contains cinder.

MUCK BAR. MATERIAL FROM WHICH AXLES WERE MADE.

		Width.	Thickness.				In 20″.		
		Inches.	*Inch.*						
538	A.	2.98	.76	2.26	26,110	46,150	17.0	21.2	Fibrous, lamellar.
539	B.	2.85	.76	2.16	25,930	45,420	16.4	20.8	Fibrous, lamellar.

TABULATION OF SPECIMENS CUT FROM TENDER-AXLES WHICH HAD NEVER BEEN IN USE.

No. of test.	Marks.	Length of stem.	Diameter.	Sectional area.	Elastic limit per square inch.	Tensile strength per square inch.	Elongation in 10″.	Contraction of area.	Appearance of fracture.
		Inches.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Per cent.*	*Per cent.*	
1524	M B_1 1 a	12	1.129	1.00	22,000	46,510	24.0	35.0	Fibrous.
1525	M B_1 1 b	12	1.129	1.00	20,500	45,390	21.0	30.6	Fibrous, 90 per cent.; granular, 10 per cent.; surface cracks.
1526	M B_1 1 c	12	1.129	1.00	22,000	46,860	21.3	27.6	Fibrous; spot of granular metal.
1527	M B_1 2 a	12	1.129	1.00	28,500	45,220	26.8	51.0	Fine fibrous.
1528	M B_1 2 b	12	1.129	1.00	25,500	46,980	22.8	45.9	Fine fibrous.
1529	M B_1 2 c	12	1.129	1.00	25,000	45,750	22.3	43.3	Bar not fractured; to be broken after a period of rest.
1530	M B_1 3 a	12	1.129	1.00	19,500	45,700	26.7	43.3	Fibrous seamy.
1531	M B_1 3 b	12	1.129	1.00	19,500	46,590	23.1	39.2	Fibrous seamy; traces of granular metal.
1532	M B_1 3 c	12	1.129	1.00	19,000	45,810	25.2	43.3	Fibrous.
1533	M B_2 1 a	12	1.129	1.00	22,000	48,160	25.5	39.2	Fibrous; small spot of granular metal.
1534	M B_2 1 b	12	1.129	1.00	21,000	47,260	23.2	24.6	Fibrous seamy.
1535	M B_2 1 c	12	1.129	1.00	22,500	46,890	23.8	37.8	Fibrous seamy.
1536	M B_2 2 a	12	1.129	1.00	25,500	47,050	25.0	45.9	Fine fibrous.
1537	M B_2 2 b	12	1.129	1.00	24,000	46,280	25.7	53.4	Fine fibrous.
1538	M B_2 2 c	12	1.129	1.00	25,500	47,120	19.7	32.1	Bar not fractured.
1539	M B_2 3 a	12	1.129	1.10	22,000	47,660	25.0	36.4	Fibrous, 95 per cent.; granular, 5 per cent.
1540	M B_2 3 b	12	1.129	1.00	21,500	47,020	24.0	39.2	Fibrous seamy.
1541	M B_2 3 c	12	1.129	1.00	21,500	47,175	28.1	45.9	Fibrous, with traces of granular metal.

22.—LOCOMOTIVE SIDE AND MAIN DRIVING RODS.

TESTS OF WROUGHT-IRON BARS AFTER LONG SERVICE.

Side rods Nos. 488, and 489 marked 55 R and L, were in use twelve years on a passenger locomotive, the weight of which was 35 tons, had 5½-feet driving wheels, 17″ by 22″ cylinder, carried 130 pounds per square inch steam pressure, and ran at a speed from 30 to 40 miles per hour.

The first fracture of rod R 55 occurred at the end, through the inside bolt-hole, where the sectional area was least. This fracture was inside the section held in the jaws of the testing-machine.

Grasping the rod by the stem, the second fracture took place near the middle of its length.

The fractures were fibrous, except that part which followed an unwelded seam.

Rod L 55 was first tested by compression, and after a permanent deflection of 1″.57 was received it was tested by tension. The tensile fractures, four in number, all showed fibrous metal.

One bar, taken from the middle part of the rod, is reserved for future test.

Side-rod test No. 645, marked No. 1, was in use on a locomotive which had been run twenty-eight years and eight months in passenger service and one year in general train service. In all it ran 910,030 miles.

The locomotive weighed 27 tons; about 18 tons were on the driving wheels. Diameter of driving wheels, 5½ feet; cylinder, 15″ by 22″; steam pressure, 128 pounds per square inch. In passenger service the speed run was from 30 to 40 miles per hour.

This engine commenced running in April, 1855. The rod was evidently made by welding heads on each end of the stem; the lines of the scarfs were distinctly visible about 15″ from the ends. The first fracture occurred at one of these welds, and at this point the metal was granular, an appearance frequently observed in the vicinity of welds.

The bar was broken again, the fracture occurring 27″ from one end, with a fibrous appearance. The second fracture occurred at some deep scratches (″.03 deep) which were in the side of the rod before the test.

Test No. 1551, marked No. 2, is a main rod which had been run thirty-seven years and eight months—thirty-two years and eight months in freight service, the last five years in passenger service. It is estimated to have been run 860,000 miles. The engine weighed 26 tons; driving wheels, 5 feet diameter; steam pressure, 128 pounds per square inch. The engine commenced running in March, 1847.

The rod was made originally circular in cross-section, but afterwards flattened on the sides to lighten its weight.

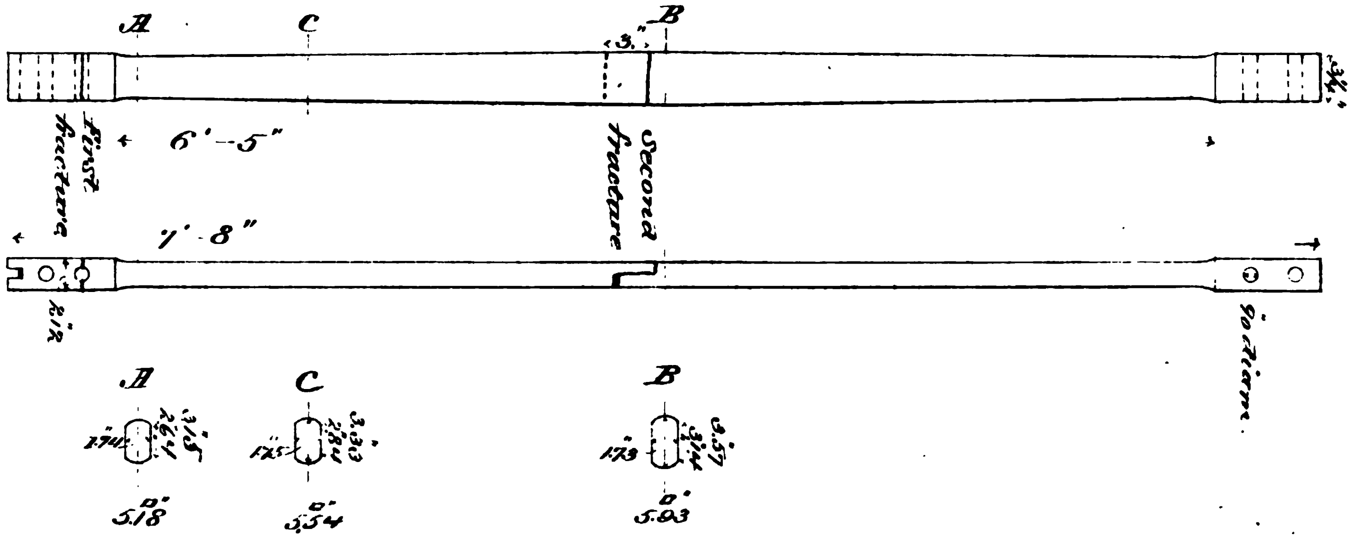
The fractures showed imperfect welds, which contained cinder; otherwise the metal was fibrous.

There are no data at command telling what the original qualities of the metal of these bars were; it is sufficient, however, to find toughness and a fibrous appearance to the iron to prove that brittleness or crystallization has not resulted from long exposure to the stresses and vibrations these bars have sustained.

The granulation observed at the weld in rod No. 645 is attributed to the weld, and not to any change in ductility from the effects of the loads it received in service. This opinion is based on the frequency of granular fractures found at welds in new metal.

The deep scratches in the side of rod No. 645 give rise to a suspicion that this rod on some occasion received a severe blow at this point, yet the metal was found to be ductile.

No. 488 R 55



Sectional area at bolt hole 3.97

S Ex 36 49 1

No. 488.

Wrought-Iron Side Rod.

Marks, R 55.

Sectional areas: At center of rod, 5.93 square inches; 25″ from center of rod, 5.54 square inches.

Gauged length, 50″ symmetrical with ends.

Tension Test.

Applied loads.			In gauged length.		Remarks.
Total.	Per square inch.		Elongation.	Set.	
	Section C.	Section B.			
Pounds.	*Pounds.*	*Pounds.*	*Inch.*	*Inch.*	
5, 000	....	....	0.	0.	Initial load.
25, 000	....	....	.0060	0.	
50, 000	....	....	.0139	0.	
75, 000	....	....	.0218	0.	
100, 000	....	....	.0278	0.	
110, 000	....	....	.0312	....	
120, 000	....	....	.0343	....	
125, 000	....	....	.0360	—.0012	
130, 000	....	....	.0367	....	
185, 000	....	....	.0395	....	
140, 000	....	....	.0410	....	
145, 000	26, 170	24, 450	.0429	....	Elastic limit.
150, 000	....	....	.0458	.0012	
155, 000	....	....	.0485	....	
160, 000	....	....	.0663	.0200	
165, 000	....	....	.0980	....	
170, 000	....	....	.2155	.1680	
200, 000	....	....	....	....	

Load released and 5″ sections measured: ″.16, ″.14, ″.12, ″.11, ″.11, ″.08, ″.07, ″.09, ″.09, ″.11, ″.11, ″.13, ″.16, ″.19.

Applied loads.			In gauged length.		Remarks.
Total.	Per square inch.		Elongation.	Set.	
	Section A.	Section B.			
Pounds.	*Pounds.*	*Pounds.*	*Inch.*	*Inch.*	
221, 800	....	....	....	....	Fracture opened in neck at south end of rod.
237, 100	....	....	....	....	Broke through bolt hole at north end = 59,720 pounds per square inch.
Stretch in 5″ sections after above load: ″.39, ″.34, ″.30, ″.27, ″.24, ″.21, ″18, ″.21, ″.22, ″.25, ″.26, ″.30, ″.37, ″.47.					
The rod now clamped between the heads, leaving 50″ between the faces of the dies.					
257, 400	49, 690	43, 410	....	....	Tensile strength of the rod.

Fractured near the middle of the rod.

Total elongation of the rod over all, 10″.30.

Total elongation from head to head, 9.12.

Total elongation in gauged length, 4.69.

Elongation of 5″ sections in gauged length: ″.52, ″.45, ″.39, ″.43, (″.95 fractured section), ″.30, ″.33, ″.40, ″.42, ″.50.

The appearance of the metal at the first fracture was fibrous on either side of the bolt hole 100 per cent., varying from dark to light color in different layers.

Before reaching the maximum load, surface fractures were developed along one edge of the rod.

The fracture at the middle of the rod was apparently located by a crack (¼″ × ⅝″) at the corner.

This crack opened, and from it the metal tore apart 50 per cent. of the cross-section at this point, when an unwelded seam was reached along the middle of the thickness of the rod; following this seam a length of 3″, then the remaining part of the metal was fractured.

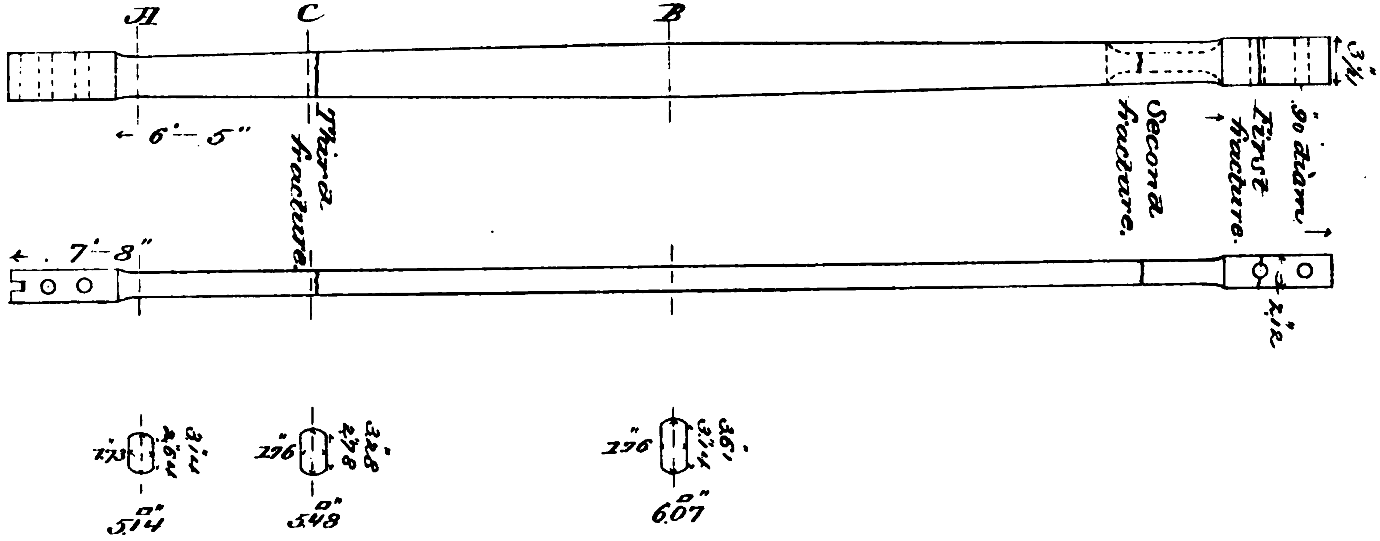
Placing the fractured ends together, the metal was open at the initial crack a width of 1″.

Except the crack and the seam, the fractured metal was fibrous.

No trace of granular metal was found in the rod.

The crack in the corner of the rod above referred to was at a small detached piece let into the rod known, in shop phraseology, as a "Dutchman."

No 489 L 55



S Ex 36 49 1

No. 489.

Compression Test.

Wrought-iron side rod, L 55.

Applied loads.			Deflections at middle.		Remarks.
Total.	Per square inch.		Horizontal.	Vertical.	
	Section A.	Section B.			
Pounds.	*Pounds.*	*Pounds.*	*Inches.*	*Inch.*	
5,000	....	....	0.	0.	Initial load.
10,000	....	....	0.	0.	
15,000	....	....	0.	0.	
20,000	....	....	0.	0.	
25,000	....	....	0.	0.	
30,000	....	....	0.	0.	
35,000	....	....	−.01	+.01	
40,000	....	....	−.02	.01	
45,000	....	....	−.03	.01	
50,000	....	....	−.03	.01	
55,000	....	....	−.03	.01	
60,000	....	....	−.03	.01	
65,000	....	....	−.04	.01	
70,000	....	....	−.04	.01	
75,000	....	....	−.04	.01	
80,000	....	....	−.05	.01	
85,000	....	....	−.06	.01	
90,000	....	....	−.07	.01	
95,000	....	....	−.08	.01	
100,000	....	....	−.09	.01	
105,000	....	....	−.10	.01	
110,000	....	....	−.13	.01	
114,000	....	....	−.18	.01	
114,500	....	....	−.22	.01	
115,000	22,370	18,950	−.26	....	
109,000	....	....	−.38	....	
95,000	....	....	−.94	....	
89,000	....	....	−1.20	....	
80,000	....	....	−1.50	....	
60,000	....	....	−2.00	....	
50,000	....	....	−2.85	....	
46,000	....	....	−2.55	....	
	Load released to initial.				
5,000	....	....	−1.57	....	

Failed by horizontal deflection, taking an outward direction as regards its position on the locomotive.

The immediate cause of failure was probably the yielding of the metal at the bolt holes, where the minimum section of metal is found.

Bar rested under zero load 40 hours, and then tested by tensile stress.

Under 234,200 pounds=58,940 pounds per square inch, rod fractured through the first bolt hole, rear end.

Elongation of 5″ sections on stem; forward end, ″.36, ″.31, ″.27, ″.24, ″.20, ″.16, ″.14, ″.16, ″.13, ″.17, ″.17, ″.24, ″.23, ″.12 rear end.

Appearance of fracture fibrous, 100 per cent.

The stretch in the last two 5″ sections at the rear end of the rod being so much less than that of the corresponding sections at the forward end, it was decided to turn down an 8″ section 1⅜″ diameter, inincluded in these less ductile sections, for the purpose of fracturing the bar in this vicinity.

Time intervening since first tensile test, 38 hours.

Sectional area reduced section (1⅜″ diameter) 1.48 square inches.

Rapid stretching occurred at 74,000 pounds = 50,000 pounds per square inch.

Tensile strength, 83,700 pounds=56,550 pounds per square inch.

Elongation of inch sections (''.31 fractured section) ''.19, ''.08, ''.07, ''.08, ''.11, ''.15, ''09.

Diameter at fracture, 1''.27. Area, 1.27 square inches.

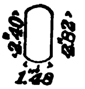
Contraction of area, 14.2 per cent.

Appearance of fracture fibrous, 100 per cent.

The rod now held by clamping upon sections of the stem between the enlarged ends, and again loaded by tensile stress.

Tensile strength 269,400 pounds=49,520 pounds per square inch.

Elongation of inch sections, 1.''49*, ''.66, ''.52, ''.40, ''.37, ''.31, ''.30.

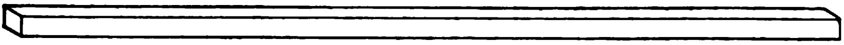
Dimensions at fracture,  = 3.97 square inches.

Fractured 14'' from enlarged head at forward end of rod.

Appearance of fracture, fibrous, 100 per cent.

From the middle part of the rod two specimens were planed, one of which was tested eleven days after the third fracture of the rod.

Form of specimens.



Sectional area 1''.71 × 1''.18 = 2.02 square inches.

Six 5'' sections laid off on specimen.

Tensile strength, 109,300 pounds = 54,110 pounds per square inch

Elongation in 30 inches, 1''.19 = 4.0 per cent.

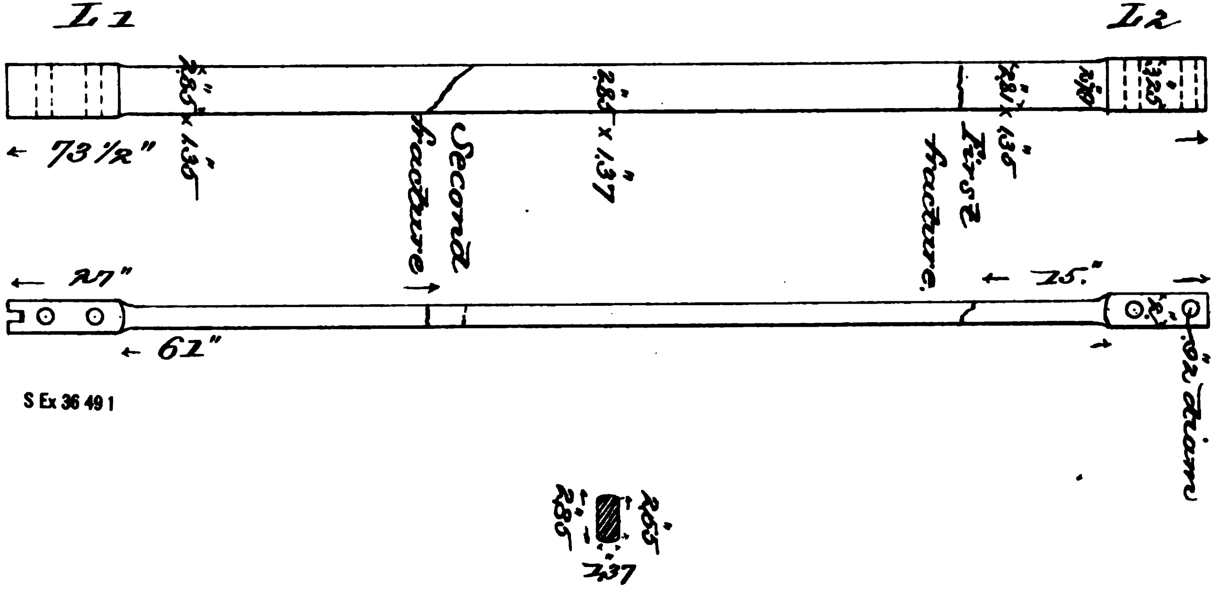
Elongation of 5'' sections after fracture, ''.15, .91*, ''.12, ''.00, ''.00, ''.01.

Area at fracture, 1''.47 × 1''.04 = 1.53 square inches.

Contraction of area, 24.2 per cent.

Appearance of fracture fibrous, 100 per cent.

No. 645 No. 1.



S Ex 36 49 1

No. 645.

Wrought-Iron Side Rod.

Mark, No. 1.

Sectional area at middle of length, 3.77 square inches.

Gauged length, 30″.

Rod secured by the stem, just inside the heads in the hydraulic jaws of the testing-machine.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
3,770	1,000	0.	0.	Initial load.
18,850	5,000	.0042	0.	
37,700	10,000	.0101	0.	
56,550	15,000	.0158	0.	
60,000	....	.0165	....	
64,000	....	.0181	....	
68,000	....	.0191	....	
72,000	....	.0201	....	
75,400	20,000	.0211	.0006	
76,000	....	.0218	....	
78,000	....	.0223	....	
80,000	....	.0226	....	
82,000	....	.0230	....	
84,000	....	.0238	....	
86,000	....	.0249	....	
88,000	....	.0253	....	
90,000	....	.0264	....	
92,000	....	.0272	....	
94,250	25,000	.0280	.0021	
96,000	....	.0291	....	
98,000	....	.0299	....	
100,000	....	.0309	....	
102,000	....	.0318	....	
104,000	27,590	.0330	....	Elastic limit.
106,000	....	.0375	....	
108,000	....	.0499	....	
110,000	....	.0590	....	
112,000	....	.0721	....	
113,100	30,000	.0812	.0489	
116,870	31,000	.0969	....	
120,640	32,000	.1490	....	
124,410	33,000	.1990	....	
128,180	34,000	.2840	....	
131,950	35,000	.35	....	
135,720	36,000	.42	....	
139,490	37,000	.51	....	
143,260	38,000	.61	....	
147,030	39,000	.71	....	
150,800	40,000	.87	....	
154,570	41,000	.98	....	
158,340	42,000	1.20	....	
162,110	43,000	1.40	....	
165,880	44,000	1.66	....	
169,650	45,000	1.98	....	
173,420	46,000	2.40	....	Tensile strength, 1st fracture. Fractured 15″ from end L_2 at a scarf weld.
178,400	47,320	....	....	Tensile strength, 2d fracture. Fractured 27″ from end L_1, at some scratches in side of rod.

Total elongation in 30″, 3.89 = 13 per cent.

Elongation of 5″ sections, (1″.78 second fracture), ″.66, ″.52, ″.21, ″.24, ″.48.

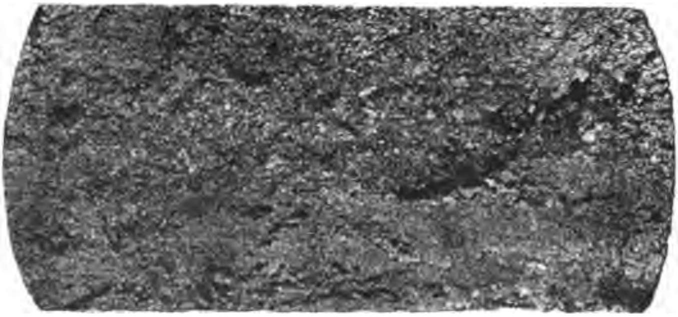
Area at first fracture, 3.30 square inches. Contraction, 12.5 per cent.

Appearance, granular, varying in degree of coarseness 70 per cent.; followed scarf weld 30 per cent.

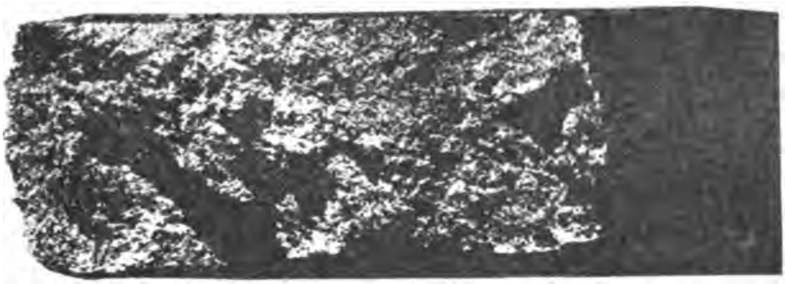
Area at second fracture, 2.30 square inches. Contraction, 39 per cent.

Appearance fibrous, 100 per cent.

PHOTOGRAPH OF THE FIRST FRACTURE OF WT. IRON SIDE ROD No. 645, SHOWING GRANULAR APPEARANCE OF THE METAL AT THE WELD.



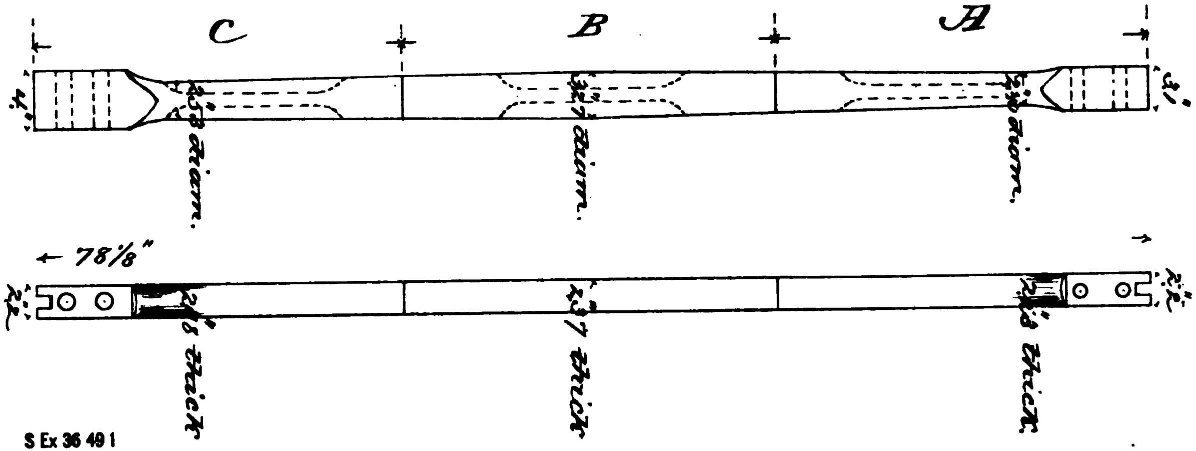
PHOTOGRAPH OF THE SECOND FRACTURE OF WT. IRON SIDE ROD No. 645. FIBROUS METAL THROUGHOUT.



S. Ex. 36, 49, 1.

No. 1551

No. 2.



S Ex 36 49 1

No. 1551.

Wrought-Iron Main Rod.

Mark, No. 1.

Rod cut into three pieces, and each turned down in the lathe to 1″.129 diameter, by 10″ long, and marked A, B, and C.

Specimen A.

Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
24,600	24,600	....	....	Elastic limit.
30,700	30,700	....	....	Tensile strength.
0	0	.05	....	Fractured at weld; 20 per cent. fibrous metal; 80 per cent. of fractured surface followed the oblique direction of the weld, which showed considerable cinder.

Specimen B.

Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
20,200	20,200	....	....	Elastic limit.
41,180	41,180	....	....	Tensile strength.
0	0	1.51	....	

Elongation of inch sections, ″.07, ″.10, ″.13, ″.18, ″.20, ″.23, ″.33*, ″.13, ″.08, ″.06.
Diameter at fracture, ″.94.
Area, .694 square inch.
Contraction, 30.6 per cent.
Appearance of fracture fibrous, spongy.

Specimen C.

Diameter, 1″.129.
Sectional area, 1.00 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1,000	1,000	0.	0.	Initial load.
21,400	21,400	....	....	Elastic limit.
42,080	42,080	....	....	Tensile strength.
0	0	1.37	....	

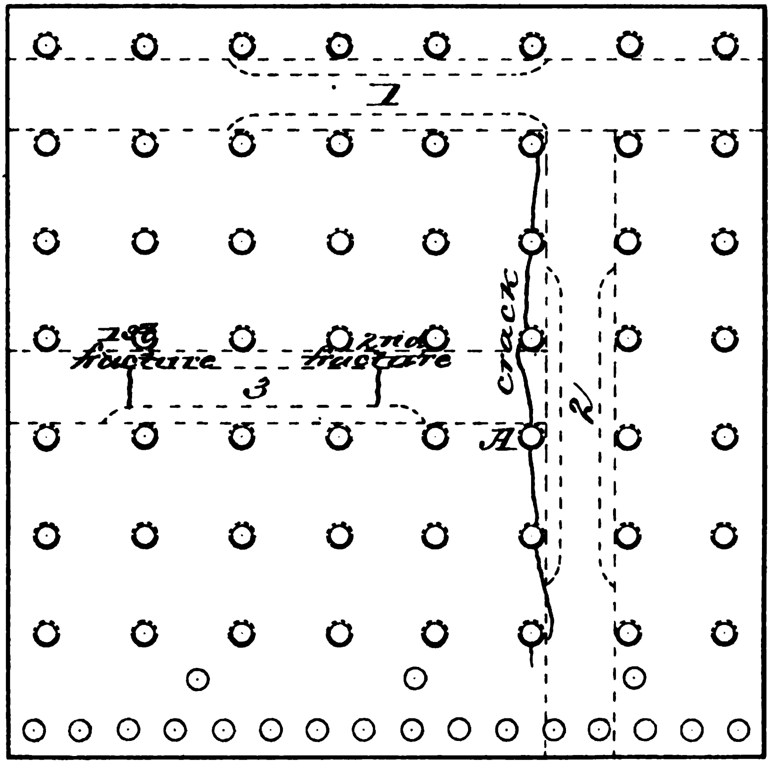
Elongation of inch sections, ″.04, ″.06, ″.07, ″.07, ″.07, ″.10, ″.16, ″.61*, ″.11, ″.08.

The stem fractured close to the neck one side of the seam, which extended along the center of the bar, the other half fractured 4 inches farther from the neck. Appearance fibrous.

23.—STEEL SPECIMENS FROM OLD FIRE-BOX OF LOCOMOTIVE BOILER.

Section of sheet sheared from
Fire Box of a Locomotive boiler.

Showing extent of crack and
and location of specimens.



The steel fire-box from which these specimens were taken was in an old locomotive which had originally a copper fire-box. The steel had been in use a number of years, the exact time is not known, when a crack was found in the crown sheet.

The construction of the fire-box was such as to necessitate its removal from the shell in order to make the repairs. In doing this, while chipping off the stay-bolt heads, one side sheet cracked in two places, and shortly afterwards the opposite sheet cracked in one place, as shown by the sketch giving the positions of the tensile specimens here recorded.

This part of the sheet was sheared out and forwarded to the arsenal for testing.

The crack extended into five stay-bolt holes, stopping 3½″ short of the edge of the sheet. These holes were ⅞″ diameter; they were threaded and spaced 3¾″ apart each way.

There was no apparent contraction in the thickness of the sheet along the line of the crack. The metal was granular with a marked radiant appearance, with stay-bolt hole *A* as the center of radiation; hence it is believed that the crack began at this hole and extended each way from it.

Three specimens were prepared, from which the strength of the sheet in the vicinity of the crack was ascertained.

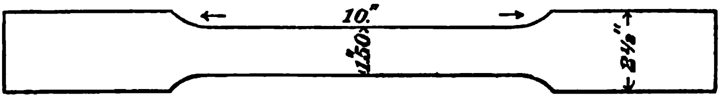
After rupture by tension the stem of specimen No. 3 was bent cold 180° and closed down; also apiece of the sheet which was taken from one edge of the crack was bent cold 180° and nearly closed down.

The elongation of the inch sections which were laid off on the stems of the specimens showed an elongation after fracture of 10 per cent. or more, while the contraction in thickness at the point of rupture, except the first fracture of bar No. 3, amounts to ″.11 to ″.13.

Here is illustrated a metal which under certain conditions fails with extreme brittleness, while under other conditions displays a fair degree of toughness and ductility, and even taken along the line of first failure can be bent cold without injury.

The analysis showed the steel to contain .17 per cent. of carbon.

Form of specimens.



No. 484.

Specimen 1.

Sectional area, ″1.496 × ″.360 = .538 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
538	1,000	0.	0.	Initial load.
2,690	5,000	.0011	0.	
5,380	10,000	.0026	0.	
8,070	15,000	.0038	0.	
10,760	20,000	.0054	0.	
13,450	25,000	.0070	.0002	
16,140	30,000	.0086	.0002	
16,600	....	.0087	....	
17,000	....	.0090	....	
17,400	....	.0093	....	
17,800	....	.0096	....	
18,200	....	.0098	....	
18,600	....	.0101	....	
18,830	35,000	.0102	.0002	
19,000	....	.0103	....	
19,400	....	.0105	....	
19,800	....	.0108	....	
20,200	....	.0111	....	
20,600	....	.0114	....	
21,000	....	.0118	....	
21,400	....	.0123	....	
21,520	40,000	.0124	.0006	
21,800	....	.0124	....	
22,200	....	.0127	....	
22,600	....	.0131	....	
23,000	....	.0137	....	
23,400	....	.0142	....	
23,800	44,240	.0146	....	Elastic limit.
24,210	45,000	.0154	.0023	
24,600	....	.0162	....	
25,000	....	.0175	....	
25,400	....	.0189	....	
25,800	....	.0204	....	
26,200	....	.0343	....	
26,600	....	.1435	....	
26,900	50,000	.1975	.1302	
29,590	55,000	.30	....	
32,280	60,000	.57	....	
34,970	65,000	1.08	....	
35,460	65,910	1.48	....	Tensile strength.
29,800	....	....	....	

Elongation after fracture, 1″.95=19.5 per cent.

Elongation of inch sections, ″.12, ″.15 (″.56 fractured section), ″.24, ″.18, ″.18, ″.15, ″.14, ″.11, ″.12.

Area at fracture, 1″.13 × ″.23 = 2.60 square inches.

Contraction of area, 51.7 per cent.

Appearance of fracture fine, silky, lamellar.

No. 485.

Specimen 2.

Sectional area, 1″.500 × ″.353 = .53 square inch.
Gauged length, 10″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
530	1,000	0.	0.	Initial load.
2,650	5,000	.0012	0.	
5,300	10,000	.0029	0.	
7,950	15,000	.0043	0.	
10,600	20,000	.0051	0.	
13,250	25,000	.0078	.0002	
15,900	30,000	.0094	.0002	
16,400	....	.0098	....	
16,800	....	.0100	....	
17,200	....	.0102	....	
17,600	....	.0105	....	
18,000	....	.0108	....	
18,550	35,000	.0112	.0002	
18,800	....	.0114	....	
19,200	....	.0116	....	
19,600	....	.0118	....	
20,000	....	.0123	....	
20,400	....	.0125	....	
20,800	....	.0128	....	
21,200	40,000	.0132	.0007	
21,600	....	.0136	....	
22,000	....	.0139	....	
22,400	....	.0146	....	
22,800	....	.0148	....	
23,200	....	.0153	....	
23,600	44,530	.0158	....	Elastic limit.
23,850	45,000	.0179	.0040	
24,000	....	.0268	....	
24,400	....	.0325	....	
24,800	....	.0386	....	
25,200	....	.0450	....	
25,600	....	.0552	....	
26,000	....	.0718	....	
26,400	....	.1692	....	
26,500	50,000	.1915	....	
29,150	55,000	.35	....	
31,800	60,000	.62	....	
33,920	64,000	1.26	....	Tensile strength.

Elongation after fracture, 1″.52 = 15.2 per cent.

Elongation of inch sections (″.49 fractured section), ″.17, ″.11, ″.12, ″.11, ″.11, ″.11, ″.11, ″.11, ″.08.

Area at fracture, 1″.20 × ″.25 = .300 square inch.

Contraction of area, 43.4 per cent.

Appearance of fracture fine, silky.

No. 486.

Specimen 3.

Sectional area, 1″.500×″.353=.53 square inch.
Gauged length, 10.″

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation per inch.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
530	1,000	0.	0.	**Initial load.**
2,650	5,000	.0014	0.	
5,300	10,000	.0032	0.	
7,950	15,000	.0018	0.	
10,600	20,000	.0062	0.	
13,250	25,000	.0078	0.	
15,900	30,000	.0097	0.	
16,400	....	.0098	....	
16,800	....	.0100	....	
17,200	....	.0102	....	
17,600	....	.0104	....	
18,000	....	.0108	....	
18,550	35,000	.0112	....	
18,800	....	.0115	....	
19,200	....	.0117	....	
19,600	....	.0118	....	
20,000	....	.0121	....	
20,400	....	.0125	....	
20,800	....	.0127	....	
21,200	40,000	.0129	0.	
21,600	....	.0133	....	
22,000	....	.0138	....	
22,400	....	.0142	....	
22,800	....	.0144	....	
23,200	....	.0148	....	
23,600	....	.0153	....	
23,850	45,000	.0155	.0010	
24,000	....	.0158	....	
24,400	....	.0162	....	
24,800	46,790	.0167	....	**Elastic limit.**
25,200	....	.0173	....	
25,600	....	.0179	....	
26,000	....	.0188	....	
26,400	....	.0199	....	
26,500	50,000	.0202	.0047	
26,800	....	.0215	....	
27,200	....	.0420	....	
27,600	....	.1190	....	
28,000	....	.2030	....	
29,150	55,000	.28	....	
31,800	60,000	.45	....	
34,400	64,910	....	....	Tensile strength, first fracture. Fractured suddenly in the neck. Appearance fine granular, radiating from a dark-colored spot of metal ″.15 diameter at the edge of the fractured surface. The metal separated at this spot $\frac{1}{16}$″ before the balance of the fracture occurred. Two seams were visible in the fractured surface [illegible]″ and $\frac{7}{16}$″ in length respectively. This fracture occurred at the farther neck from the crack in the sheet.
Immediately after this fracture, the specimen was broken again by clamping the stem at the fractured end in the holder jaws, the opposite end being secured by its enlarged end as before.				
35,950	67,830	....	....	Tensile strength, second fracture.

Elongation after fracture, 1″.76 = 17.6 per cent.

Elongation of inch sections = (″.13 first fracture), ″.11, ″.14, ″.15, ″.13, ″.12, ″.11, ″.16, (″.58, second fracture), ″.13.

Area at second fracture, 1″.12×″.23 = .258 square inch.

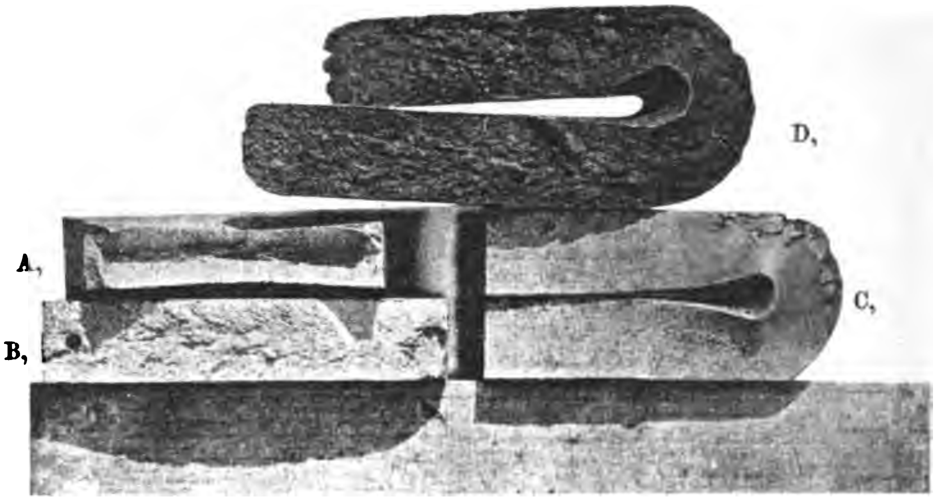
Contraction of area, 51.3 per cent.

Appearance of second fracture fine, silky, lamellar.

The thickness of metal at the first fracture is ″.317.

After the second fracture the stem was bent cold 180°, and closed down on itself. At some laminated spots the metal opened slightly; otherwise no signs of injury were visible.

PHOTOGRAPHS OF FRACTURED ENDS AND COLD BENT SPECIMENS, FROM OLD FIRE BOX OF LOCOMOTIVE BOILER.



S. Ex. 36, 49, 1.

A. SILKY FRACTURE OF SPECIMEN No. 486.

B. GRANULAR FRACTURE OF SPECIMEN No. 486.

C. STEM OF SPECIMEN No. 486, BENT COLD, AFTER TESTING.

D. PIECE OF SHEET, CONTAINING ORIGINAL CRACKED SURFACE, BENT COLD.

21.—TEMPERATURE TESTS OF WROUGHT-IRON BARS.

A number of preliminary tests of hot wrought-iron bars have been made preparatory to an extended series of tests of wrought-iron, steel, and cast-iron bars which has been projected, and the material obtained.

In these few trials the bars were heated in an open forge fire, then placed in the testing-machine and observations made on the contractile force developed by their cooling, the elastic limits and ductility of the hot and cold sections when strained to the limit of rupture.

No. 100.

Wrought-Iron Bar.

Length, 96″.

Sectional area, 2″.53 × 1″.25 = 3.16 square inches.

Three 20″ sections laid off along the middle of the length of the bar before the test.

The middle part of the bar was heated in a forge fire; a length of 8″ was burnt.

When placed in the testing-machine, 12″ was light red; the ends of the bar were cool.

Length between holders, 68″.

The ends were rigidly clamped in the holder jaws.

A micrometer with extension rods reached from holder to holder; this was applied for the purpose of keeping a fixed distance between them.

As the specimen cooled, causing a load of tension on the bar, the distance between the holders was maintained constant by a slight movement of the piston of the straining-press, to compensate for the compression of the main screws and resisting portions of the testing-machine.

Means were not at hand for determining the temperature of the bar during the progress of the test.

Immediately upon clamping the bar in the testing-machine, the contractile force was felt, and was gradually increased as the temperature fell, to the maximum of 99,900 pounds = 31,610 pounds per square inch on the bar.

The cooling was hastened by wetting the bar when the contractile force had reached 93,800 pounds, which had the effect of suddenly increasing the force to 99,900 pounds, when there was sudden yielding, the load falling to 90,000 pounds, accompanied by an increase in length between the holder jaws of ″.002.

This movement of ″.002 was doubtless due to the recovery of the parts of the testing-machine, when the load on the test bar fell.

From 90,000 pounds, the reduced load, there was a gradual increase of the contractile force to the maximum amount, and then again the load fell as before, except it did not go below 94,000 pounds.

The contractile force again increased to 99,000 pounds. The bar was now allowed to cool.

When its temperature had reached the temperature of the room (78° Fahr.); two hours in the mean time having elapsed, it was found that 104,700 pounds tension on the bar was required to restore the holders to their original distance apart.

When releasing the load the permanent stretch of the bar was found ″.0474 in a length of 60″.

Tensile test now made with the bar cold.

Elongations measured in a gauged length of 60″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
3,160	1,000	0.	0.	Initial load.
15,800	5,000	.0088	.0003	
81,600	10,000	.0199	.0000	
47,400	15,000	.0305	.0003	
63,200	20,000	.0414	..0003	
79,000	25,000	.0523	.0004	
94,800	80,000	.0633	.0006	
96,000	....	.0642	....	
97,000	....	.0649	....	
98,000	....	.0655	....	
99,000	....	.0661	....	
100,000	....	.0668	....	
101,000	....	.0675	....	
102,000	....	.0684	....	
103,000	....	.0692	....	
104,000	....	.0700	....	
105,000	....	.0709	....	
106,000	33,540	.0719	....	Elastic limit.
107,000	....	.2600	....	
108,000	....	.5030	....	
109,000	....	.6065	....	
110,600	35,000	.6920	....	
113,760	36,000	.76	....	
116,920	37,000	.94	....	
120,080	38,000	1.17	....	
123,240	39,000	1.34	....	
126,400	40,000	1.56	....	
164,200	51,960	....	....	Tensile strength.

Elongation after rupture, 8″.58 = 14.3 per cent.

Elongation of 10″ sections, 1″.81, 1″.74*, 1.10, 1.09, 1″.30, 1″.54.

Area at fracture, 2″.30 × 1″.12 = 2.58 square inches.

Contraction, 18.4 per cent.

Appearance of fracture, fibrous, laminated; small granular spots 5 per cent. of surface.

The tensile test of this bar shows that the contractile force, due to cooling from a dull red of the middle portion of the bar, was equal to the load at the elastic limit of the metal cold.

This contraction was sufficient to cause a permanent set of ″.0474 distributed over a length of 60″.

The elongations of the 10″ sections measured after fracture show less stretch along the middle sections, where the bar had been slightly burnt, than at the ends.

No. 101.

(Same kind of iron as No. 100.,

Total length of bar, 96″.

Sectional area, 2″.53 × 1″.25 = 3.16 square inches.

Distance between holder jaws, 70″.

Ten inches length along the middle of the bar was heated light red in a forge fire. The ends were cool, and could be handled.

The bar was placed in the testing-machine, and when cooled so that the color had just left, the ends were clamped and a strain of tension applied.

The object of this test was to begin the stretch of the metal when at a temperature of about 1,000° Fahr., and so regulate the time of the test that the bar should have cooled to about 300° Fahr. at the time of rupture.

Under the load, 42,000 pounds = 13,290 pounds per square inch—which was at once applied, rapid stretch began, indicating that the elastic limit of some portion of the bar, at the temperature it then had, was reached.

The stretching went on continuously as the temperature of the bar fell; at the same time the resistance gradually increased.

When 100,000 pounds tension was reached the peculiar behavior observed in bar No. 100 was displayed by this specimen; that is, there were momentary periods in which the load sustained by the bar would suddenly fall, but which the metal quickly recovered from. These fluctuations ranged from 2,000 pounds to 6,000 pounds, and occurred at intervals of 2 to 4 seconds of time, and continued for the remainder of the test.

While under 140,000 pounds tension the bar was struck three heavy blows with a 6-pound hammer, causing a slight stretch of the metal, as shown by the momentary fall of the load immediately after each blow was delivered.

Continuing the stretching, the tensile strength of the bar was found 163,200 pounds = 51,650 pounds per square inch.

The bar fractured 22″ from the middle of its length. Time of test, 20 minutes.

Appearance of fracture, fibrous lamellar, with a small spot of granular metal.

Area at fracture, 2″.30 × 1″.11 = 2.55 square inches.

Contraction, 19.3 per cent.

Elongation after rupture, 7″.06 in 70″ = 10.1 per cent.

Elongation of 10″ sections, 1″.64, 1″.13, ″.39, ″.61, ″.41, 1″.40*, 1″.48.

It will be observed that the maximum elongation was 16.4 per cent. in one end section, while the middle sections only showed 3.9 per cent. to 6.1 per cent. stretch.

No. 102.

Tensile test (cold) of a bar of the same kind of metal as bar No. 100.
Sectional area, 2″.53 × 1″.25 = 3.16 square inches.
Gauged length, 60″.
Distance between holder jaws, 70″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
3,100	1,000	0.	0.	Initial load.
15,800	5,000	.0097	0.	
31,600	10,000	.0207	0.	
47,400	15,000	.0328	.0001	
63,200	20,000	.0411	.0005	
65,000	....	.0444	....	
67,000	....	.0461	....	
69,000	....	.0476	....	
71,000	....	.0490	....	
73,000	....	.0504	....	
75,000	....	.0520	....	
77,000	....	.0534	....	
79,000	25,000	.0551	.0013	
81,000	....	.0569	....	
83,000	....	.0583	....	
85,000	....	.0600	....	
87,000	....	.0614	....	
89,000	....	.0636	....	
90,000	....	.0648	....	
91,000	....	.0656	....	
92,000	....	.0664	....	
93,000	....	.0679	....	
94,000	....	.0689	....	
94,800	30,000	.0703	.0057	
96,000	....	.0723	....	
97,000	....	.0737	....	
98,000	31,010	.0752	....	Elastic limit.
99,000	....	.0853	....	
100,000	....	.1330	....	
101,000	....	.1400	....	
102,000	....	.2560	....	
103,000	....	.4080	....	
104,000	....	.5080	....	
105,000	....	.5570	....	
106,000	....	.5880	....	
107,000	....	.6140	....	
108,000	....	.6530	....	
109,000	....	.6870	....	
110,600	35,000	.7150	....	
113,760	36,000	.82	....	
116,920	37,000	1.02	....	
120,080	38,000	1.21	....	
123,240	39,000	1.73	....	
126,400	40,000	1.97	....	
163,600	51,770	....	....	Tensile strength.

Elongation after rupture, 11″.28 = 18.8 per cent.

Elongation of 10″ sections, 1″.82, 2″.11, 2″.44*, 1″.97, 1″.62, 1″.52, 1″.45.

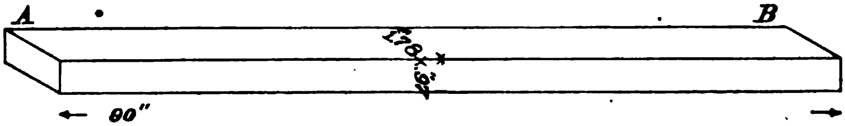
Area at fracture, 2″.25 × 1″.07 = 2.41 square inches.

Contraction, 23.7 per cent.

Appearance of fracture fibrous, laminated; small spots of granular metal at one corner.

No. 104.

Wrought-Iron Bar.



Sectional area, 1.73 square inches.

Ten inches at the middle of the bar heated bright red in a forge fire.

When taken from the fire the expansion in 20″ sections was as follows: End A, ″.0206; Middle, ″.1324; End B, ″.0058. Showing a total expansion of ″.1588 in 60″ length of bar.

Before clamping in the holder jaws, the temperature of the middle section was reduced to just below red hot.

During the time of cooling the holder jaws were held at a fixed distance apart, as in the other tests; hence the contractile force caused a permanent set in the bar, which micrometer measurements of the bar when cold showed to be as follows:

End A, ″.0067; Middle, ″.0091; End B, ″.0015.

Total permanent set, ″.0173 in 60″.

The maximum contractile force developed was 57,700 pounds = 33,350 pounds per square inch.

This force was gradually developed while cooling of the bar took place, until 55,000 pounds tension was reached, when there was a reduction to 53,200 pounds from which the bar recovered to 57,100 pounds, then fell to 55,700 pounds, again recovered and reached the maximum 57,700 pounds, and again fell to 54,700 pounds, then recovered to 57,000 pounds, where it remained till the bar became cold.

Tensile test now made with the bar cold.

Elongations measured in a gauged length of 60″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
1,730	1,000	0.	0.	Initial load.
8,650	5,000	.0085	0.	
17,300	10,000	.0196	0.	
25,950	15,000	.0308	−.0001	
34,600	20,000	.0420	−.0001	
43,250	25,000	.0539	−.0002	
51,900	30,000	.0643	−.0002	
53,000	....	.0658	....	
54,000	....	.0669	....	
55,000	....	.0685	....	
56,000	....	.0698	....	
57,000	....	.0710	....	
58,000	....	.0723	....	
59,000	....	.0736	....	
60,000	34,680	.0751	....	Elastic limit.
61,000	....	....	....	
62,000	....	....	....	
62,280	36,000	....	....	
65,740	38,000	....	....	
69,200	40,000	....	....	
72,660	42,000	....	....	
76,120	44,000	....	....	
79,580	46,000	....	....	
83,040	48,000	....	....	
86,500	50,000	....	....	
89,960	52,000	....	....	
91,980	53,170	....	....	Tensile strength.

Elongation after rupture, 7″.79 = 13.0 per cent.

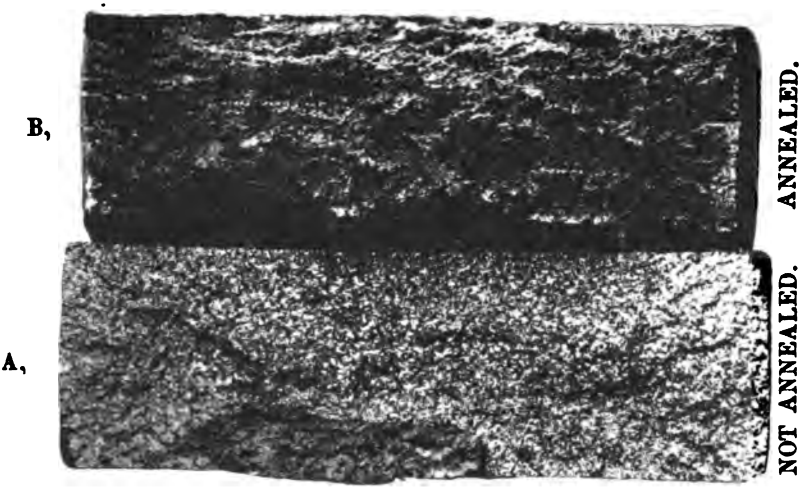
Elongation of 10″ sections, 1″.19, 1″.14, 1″.04, 1″.22, 1″.69*, 1″.51.

Area at fracture, 1″.62 × ″.87 = 1.41 square inches.

Contraction, 18.5 per cent.

Appearance of fracture, fibrous, 90 per cent.; granular, 10 per cent.

PHOTOGRAPH OF THE FRACTURED ENDS OF BAR 103.



S. Ex. 36, 49, 1.

A. GRANULAR APPEARANCE WHEN RETESTED AFTER 43 MONTHS' REST. NOT ANNEALED.

B. FIBROUS APPEARANCE WHEN RETESTED AFTER 43 MONTHS' REST. ANNEALED.

26.—TENSION TEST OF STEEL STRAP.

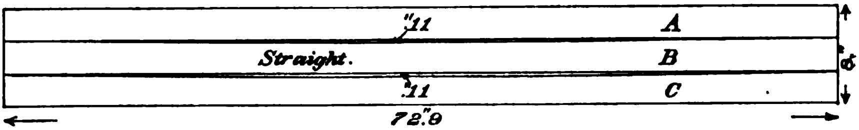
[Furnished by Fuller, Dana & Fitz, Boston, Mass., for improved gun-carriages.]

The strap was cut into three test pieces by longitudinal cuts, in a planer.

Initial strains in the metal caused the outside strips to spring concave on the inside edge of each. The middle strip was straight.

Sketch showing springing of test pieces when removed from removed from the planer.

Strap branded
The Spang Steel & Iron Co., Limited.
F. B.
65,000 Pittsburgh.
T. S.



Before testing, specimens A and C were straightened, by planing their edges.

No. 457.

Tension Test.

SPECIMEN A.

Sectional area, 2″.16×″.983 = 2.12 square inches.
Length between faces of holder jaws, 50″.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,120	1,000	0.	0.	0.	0.	Initial load.
10,600	5,000	.000145	.000145	.000007	.000007	
21,200	10,000	.000320	.000175	.000007	0.	
31,800	15,000	.000500	.000180	.000007	0.	
42,400	20,000	.000672	.000172	.000007	0.	
53,000	25,000	.000855	.000183	.000007	0.	
54,000	....	.000860	.000005	....	....	
55,000	....	.000882	.000022	....	....	
56,000	....	.000897	.000015	....	....	
57,000	....	.000915	.000018	....	....	
58,000	....	.000937	.000022	....	....	
59,000	....	.000950	.000013	....	....	
60,000	....	.000967	.000017	....	....	
61,000	....	.000985	.000018	....	....	
62,000	....	.000997	.000012	....	....	
63,000	....	.001015	.000018	....	....	
63,600	30,000	.001027	.000012	.000010	.000003	
64,000	....	.001032	.000005	....	....	
65,000	....	.001050	.000018	....	....	
66,000	....	.001062	.000012	....	....	
67,000	....	.001077	.000015	....	....	
68,000	....	.001097	.000020	....	....	
69,000	....	.001117	.000020	....	....	
70,000	....	.001127	.000010	....	....	
71,000	....	.001147	.000020	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
72,000	....	.001172	.000025	....	....	
73,000	....	.001190	.000018	....	....	
74,000	....	.001202	.000012	....	....	
74,200	35,000	.001210	.000008	.000027	.000017	
75,000	....	.001222	.000012	....	....	
76,000	35,850	.001240	.000018	....	....	Elastic limit.
77,000	....	.001297	.000057	....	....	
78,000	....	.001485	.000188	....	....	
79,000	....	.002037	.000552	....	....	
80,000	....	.004150	.002113	....	....	
81,000	....	.004925	.000775	....	....	
82,000	....	.006850	.001925	....	....	
83,000	....	.009000	.002150	....	....	
84,000	....	.016500	.007500	....	....	
84,800	40,000	.021375	.004875	....	....	
86,920	41,000	.0230	.001625	....	....	
89,040	42,000	.0242	.0012	....	....	
91,160	43,000	.0260	.0018	....	....	
93,280	44,000	.0270	.0010	....	....	
95,400	45,000	.0290	.0020	....	....	
97,520	46,000	.0312	.0022	....	....	
99,640	47,000	.0350	.0038	....	....	
101,760	48,000	.0367	.0017	....	....	
103,880	49,000	.0392	.0025	....	....	
106,000	50,000	.0425	.0033	....	....	
110,240	52,000	.0480	.0055	....	....	
114,480	54,000	.0580	.0100	....	....	
118,720	56,000	.0687	.0107	....	....	
122,960	58,000	.0807	.0120	....	....	
127,200	60,000	.1012	.0205	....	....	
131,440	62,000	.1512	.0500	....	....	
131,900	62,220	.1775	.0263	....	....	Tensile strength.
123,000	....	....	....	....	....	Load at time of rupture.

Elongation per inch after rupture, ″.186.

Elongation of 5″ sections: ″.93, 1″.18, 1″.23*, ″.93, ″.96, ″.80, ″.83, ″.82, ″.70, ″.61.

Area at fracture, 1″.84×″.81=1.49 square inches.

Contraction of area, 29.7 per cent.

Fractured 13½″ from face of holder jaws, beginning at outside corner of bar. This corner was open ″.10 after fracture.

Appearance of fracture fine silky, slight lamination.

No. 458.

Tension Test.

SPECIMEN B.

Sectional area, 2″.425 × ″.985 = 2″.39 square inches.
Length between faces of holder jaws, 50″.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 390	1, 000	0.	0.	0.	0.	Initial load.
11, 950	5, 000	.000122	.000122	0.	....	
23, 900	10, 000	.000310	.000188	—.000005	—.000005	
35, 850	15, 000	.000477	.000167	—.000005	0.	
47, 800	20, 000	.000647	.000170	0.	.000005	
59, 750	25, 000	.000822	.000175	0.	0.	
71, 700	30, 000	.001005	.000183	.000010	.000010	
73, 000	....	.001025	.000020	....	....	
74, 000	....	.001047	.000022	....	....	
75, 000	....	.001060	.000013	....	....	
76, 000	....	.001072	.000012	....	....	
77, 000	....	.001085	.000013	....	....	
78, 000	....	.001110	.000025	....	....	
79, 000	....	.001125	.000015	....	....	
80, 000	....	.001142	.000017	....	....	
81, 000	....	.001160	.000018	....	....	
82, 000	....	.001182	.000022	....	....	
83, 000	34, 730	.001217	.000035	....	....	Elastic limit.
83, 650	35, 000	.001247	.000030	.000110	.000100	
84, 000	....	.001292	.000045	....	....	
85, 000	....	.001475	.000183	....	....	
86, 000	....	.001775	.000300	....	....	
87, 000	....	.002550	.000775	....	....	
88, 000	....	.004500	.001950	....	....	
89, 000	....	.006750	.002250	....	....	
90, 000	....	.008500	.001750	....	....	
91, 000	....	.012375	.003875	....	....	
92, 000	....	.013000	.000625	....	....	
93, 000	....	.014250	.001250	....	....	
94, 000	....	.018375	.004125	....	....	
95, 000	....	.019500	.001125	....	....	
95, 600	40, 000	.019800	.000300	....	....	
97, 900	41, 000	.021000	.001200	....	....	
100, 380	42, 000	.0230	.0020	....	....	
102, 770	43, 000	.0247	.0017	....	....	
105, 160	44, 000	.0262	.0015	....	....	
107, 550	45, 000	.0282	.0020	....	....	
109, 940	46, 000	.0305	.0023	....	....	
112, 330	47, 000	.0330	.0025	....	....	
114, 720	48, 000	.0355	.0025	....	....	
117, 110	49, 000	.0380	.0025	....	....	
119, 500	50, 000	.0407	.0027	....	....	
124, 280	52, 000	.0475	.0068	....	....	
129, 060	54, 000	.0542	.0067	....	....	
133, 840	56, 000	.0655	.0113	....	....	
138, 620	58, 000	.0800	.0145	....	....	
143, 400	60, 000	.0985	.0185	....	....	
148, 100	61, 970	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ″.134.

Elongation of 5″ sections: ″.68, ″.72, ″.68, ″.62, ″.93*, ″.62, ″.62, ″.61, ″.58, ″.59.

Area at fracture 2″.17 × ″.85 = 1.84 square inches.

Contraction of area, 23.0 per cent.

Fractured near the middle of the length of the bar. The fracture began on the side which was next specimen C in the strap. This edge was open ″.20 after fracture.

Appearance of fracture fine silky; contains a layer of light-colored metal.

No. 459.

Tension Test.

SPECIMEN C.

Sectional area, 2″.156×″.985=2.12 square inches.
Length between faces of holder jaws, 50″.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 120	1, 000	0.	0.	0.	0.	Initial load.
10, 600	5, 000	.000140	.000140	0.	....	
21, 200	10, 000	.000305	.000165	.000012	.000012	
81, 800	15, 000	.000480	.000175	.000012	0.	
42, 400	20, 000	.000647	.000167	.000012	0.	
53, 000	25, 000	.000812	.000165	.000012	0.	
63, 600	80, 000	.000982	.000170	.000020	.000008	
64, 000	....	.000987	.000005	....	....	
65, 000	....	.001012	.000025	....	....	
66, 000	....	.001025	.000013	....	....	
67, 000	....	.001047	.000022	....	....	
68, 000	....	.001052	.000005	....	....	
69, 000	....	.001070	.000018	....	....	
70, 000	....	.001087	.000017	....	....	
71, 000	....	.001102	.000015	....	....	
72, 000	....	.001122	.000020	....	....	
73, 000	....	.001135	.000013	....	....	
74, 200	35, 000	.001155	.000020	.000037	.000017	
75, 000	....	.001172	.000017	....	....	
76, 000	....	.001190	.000018	....	....	
77, 000	....	.001205	.000015	....	....	
78, 000	86, 790	.001222	.000017	....	....	Elastic limit.
79, 000	....	.001287	.000065	....	....	
80, 000	....	.001750	.000463	....	....	
81, 000	....	.002325	.000575	....	....	
82, 000	....	.004600	.002275	....	....	
83, 000	....	.005325	.000725	....	....	
84, 000	....	.012250	.006925	....	....	
84, 800	40, 000	.010575	.007325	....	....	
86, 920	41, 000	.0212	.001625	....	....	
89, 040	42, 000	.0225	.0013	....	....	
91, 160	43, 000	.0242	.0017	....	....	
93, 280	44, 000	.0260	.0018	....	....	
95, 400	45, 000	.0280	.0020	....	....	
97, 520	46, 000	.0300	.0020	....	....	
99, 640	47, 000	.0322	.0022	....	....	
101, 760	48, 000	.0342	.0020	....	....	
103, 880	49, 000	.0367	.0025	....	....	
106, 000	50, 000	.0392	.0025	....	....	
110, 240	52, 000	.0462	.0070	....	....	
114, 480	54, 000	.0530	.0068	....	....	
118, 720	56, 000	.0637	.0107	....	....	
122, 900	58, 000	.0750	.0113	....	....	
127, 200	60, 000	.0920	.0170	....	....	
131, 440	62, 000	.1187	.0267	....	....	
132, 560	62, 530	.1345	.0158	....	....	Tensile strength.

Elongation per inch after rupture, ″.132.

Elongation of 5″ sections, 1″.26*, ″.73, ″.74, ″.67, ″.70, ″.68, ″.61, ″.59, ″.54, ″.52.

Area at fracture, 1″.88×″.82=1.54 square inches.

Contraction of area, 27.4 per cent.

Fractured 3″ from face of holder jaws.

The fracture began on the inside edge of the bar. This side was open ″.10 after fracture.

Appearance of fracture, fine silky 55 per cent., including a layer of light-colored metal, for the inside part, or that next specimen B in the strap. The outside section 45 per cent. fine granular.

The fractured ends were submitted to bending tests with the following results:

First sample, in the condition it was taken from the testing machine, bent cold about 85°, when fractures were opened on the convex side of bend.

A second bar bent 140° and then showed cracks.

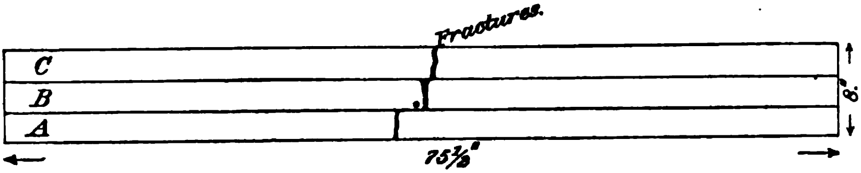
A third bar bent cold after annealing 180° and closed down without fracture; also, samples brought to a welding heat and allowed to cool, and those tested while at a welding heat bent double without injury.

WROUGHT-IRON BARS.—MATERIAL FOR GUN-CARRIAGE STRAPS.

[Furnished by A. G. Tompkins & Co.]

Strap No. 1.

Location of specimens in strap.



No. 531.

Specimen A.

Sectional area, 2''.32 × 1''.25 = 2.90 square inches.

Gauged length, 40''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 900	1, 000	0.	0.	0.	0.	Initial load.
14, 500	5, 000	.000130	.000130	0.	....	
29, 000	10, 000	.000305	.000175	0.	....	
43, 500	15, 000	.000500	.000195	.000008	.000008	
46, 000	....	.000530	.000030	....	....	
48, 000	....	.000560	.000030	....	....	
50, 000	....	.000585	.000025	....	....	
52, 000	....	.000610	.000025	....	....	
54, 000	....	.000633	.000023	....	....	
56, 000	....	.000660	.000027	....	....	
58, 000	20, 000	.000687	.000027	.000020	.000012	
60, 000	....	.000720	.000033	....	....	
62, 000	....	.000745	.000025	....	....	
64, 000	....	.000767	.000022	....	....	
66, 000	....	.000797	.000030	....	....	
68, 000	....	.000825	.000028	....	....	
69, 000	....	.000848	.000023	....	....	
70, 000	....	.000863	.000015	....	....	
71, 000	....	.000875	.000012	....	....	
72, 000	....	.000895	.000020	....	....	
72, 500	25, 000	.000905	.000010	.000058	.000038	
73, 000	....	.000923	.000018	....	....	
74, 000	....	.000935	.000012	....	....	
75, 000	....	.000958	.000023	....	....	
76, 000	....	.000985	.000027	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
77, 000	....	.000998	.000013	....	....	
78, 000	....	.001020	.000022	....	....	
79, 000	....	.001050	.000030	....	....	
80, 000	....	.001075	.000025	....	....	
81, 000	27, 930	.001100	.000025	....	....	Elastic limit.
82, 000	....	.001170	.000070	....	....	
83, 000	....	.001285	.000115	....	....	
84, 000	....	.001550	.000265	....	....	
85, 000	....	.003490	.001940	....	....	
86, 000	....	.004687	.001197	....	....	
87, 000	30, 000	.006730	.002043	....	....	
89, 900	31, 000	.0078	.001070	....	....	
92, 800	32, 000	.0103	.0025	....	....	
95, 700	33, 000	.0123	.0020	....	....	
98, 000	34, 000	.0153	.0030	....	....	
101, 500	35, 000	.0185	.0032	....	....	
104, 400	36, 000	.0210	.0025	....	....	
107, 300	37, 000	.0248	.0038	....	....	
110, 200	38, 000	.0283	.0035	....	....	
113, 100	39, 000	.0338	.0055	....	....	
116, 000	40, 000	.0388	.0050	....	....	
118, 900	41, 000	.0400	.0012	....	....	2′ rest
121, 800	42, 000	.0495	.0095	....	....	
124, 700	43, 000	.0545	.0050	....	....	
127, 600	44, 000	.0625	.0080	....	....	
130, 500	45, 000	.0703	.0078	....	....	
133, 400	46, 000	.0805	.0102	....	....	
136, 800	47, 000	.0950	.0145	....	....	
139, 200	48, 000	.1035	.0085	....	....	
141, 200	49, 000	.1195	.0160	....	....	
142, 800	49, 240	.1245	.0050	....	....	Tensilee strength.

Elongation per inch after rupture, ″.124.

Elongation of 5″ sections, ″.57, ″.62, ″.65, ″.63, (″.75 fractured section), ″.62, ″.57, ″.55.

Area at fracture, 2″.21 × 1.12″ = 2.48 square inches.

Contraction of area, 14.5 per cent.

Appearance of fracture fibrous 80 per cent., granular 20 per cent.

No. 532.

Specimen B.

Sectional area, 2''.32 × 1''.25 = 2.90 square inches.
Gauged length, 40''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 900	1, 000	0.	0.	0.	.0.	Initial load.
14, 500	5, 000	.000140	.000140	0.		
29, 000	10, 000	.000333	.000193	0.		
43, 500	15, 000	.000508	.000175	0.		
46, 000		.000543	.000035			
48, 000		.000567	.000024			
50, 000		.000595	.000028			
52, 000		.000620	.000025			
54, 000		.000645	.000025			
56, 000		.000670	.000025			
58, 000	20, 000	.000698	.000028	.000023	.000023	
60, 000		.000725	.000027			
62, 000		.000750	.000025			
64, 000		.000775	.000025			
66, 000		.000800	.000025			
68, 000		.000830	.000030			
70, 000		.000858	.000028			
72, 000		.000890	.000032			
72, 500	25, 000	.000900	.000010	.000055	.000032	
73, 000		.000913	.000013			
74, 000		.000938	.000025			
75, 000		.000953	.000015			
76, 000		.000975	.000022			
77, 000		.000998	.000028			
78, 000		.001018	.000020			
79, 000		.001038	.000020			
80, 000	27, 590	.001062	.000024			Elastic limit.
81, 000		.001108	.000046			
82, 000		.001175	.000067			
83, 000		.001325	.000150			
84, 000		.001675	.000350			
85, 000		.001825	.000150			
86, 000		.004163	.002338			
87, 000	30, 000	.005150	.000987			
89, 000	31, 000	.006750	.001600			
92, 800	32, 000	.008800	.002050			
95, 700	33, 000	.011200	.002400			
98, 600	34, 000	.013475	.002275			
101, 500	35, 000	.016250	.002775			
104, 400	36, 000	.019400	.003150			
107, 300	37, 000	.022625	.003225			
110, 200	38, 000	.0270	.004375			
113, 100	39, 000	.0317	.0047			
116, 000	40, 000	.0363	.0046			
118, 900	41, 000	.0422	.0059			
121, 800	42, 000	.0483	.0061			
124, 700	43, 000	.0532	.0049			
127, 600	44, 000	.0608	.0076			
130, 500	45, 000	.0717	.0109			
133, 400	46, 000	.0820	.0103			
136, 300	47, 000					Tensile strength.

Elongation per inch after rupture, ''.097.

Elongation of 5'' sections, ''.46, ''.47, ''.47, ''.46, ''.45 (.''63 fractured section), ''.47, ''.47.

Area at fracture, 2''.24 × 1''.14 = 2.55 square inches.

Contraction of area, 12.1 per cent.

Bar tore apart, the fracture beginning at the edge next specimen C. This part of the fractured surface (55 per cent.) was fibrous, the balance (45 per cent.) granular.

The fracture of the granular portion was accompanied by a loud report.

No. 533.

Specimen C.

Sectional area, 2″.32 × 1″.25 = 2.90 square inches.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,900	1,000	0.	0.	0.	0.	Initial load.
14,500	5,000	.000150	.000150	0.		
29,000	10,000	.000355	.000205	0.		
43,500	15,000	.000535	.000180	0.		
46,000		.000565	.000030			
48,000		.000597	.000032			
50,000		.000623	.000026			
52,000		.000648	.000025			
54,000		.000670	.000022			
56,000		.000695	.000025			
58,000	20,000	.000723	.000028	0.		
60,000		.000753	.000030			
62,000		.000773	.000020			
64,000		.000797	.000024			
66,000		.000827	.000030			
68,000		.000853	.000026			
70,000		.000883	.000030			
72,000		.000907	.000024			
72,500	25,000	.000920	.000013	.000025	.000025	
73,000		.000935	.000015			
74,000		.000948	.000013			
75,000		.000968	.000020			
76,000		.000985	.000017			
77,000		.001000	.000015			
78,000		.001012	.000012			
79,000		.001025	.000013			
80,000		.001045	.000020			
81,000		.001068	.000023			
82,000		.001103	.000035			
83,000	28,620	.001135	.000032			Elastic limit.
84,000		.001177	.000042			
85,000		.001227	.000050			
86,000		.001473	.000246			
87,000	30,000	.001925	.000452			
89,900	31,000	.006213	.004288			
92,800	32,000	.007850	.001637			
95,700	33,000	.010475	.002625			
98,600	34,000	.012188	.001713			
101,500	35,000	.014750	.002562			
104,400	36,000	.017500	.002750			
107,300	37,000	.021125	.003625			
110,200	38,000	.023725	.002600			
113,100	39,000	.0290	.005275			
116,000	40,000	.0320	.0030			
118,900	41,000	.0362	.0042			
121,800	42,000	.0415	.0053			
124,700	43,000	.0467	.0052			
127,600	44,000	.0530	.0063			
130,500	45,000	.0605	.0075			
133,400	46,000	.0710	.0105			
136,300	47,000	.0620	.0110			
139,200	48,000	.0855	.0035			
142,100	49,000	.1012	.0157			
143,700	49,550	.1120	.0108			Tensile strength.

Elongation per inch after rupture, ″.1123.

Elongation of 5″ sections ″.55, ″.55, ″.54, ″.53, ″.51, (″.73 fractured section), ″.54, ″.54.

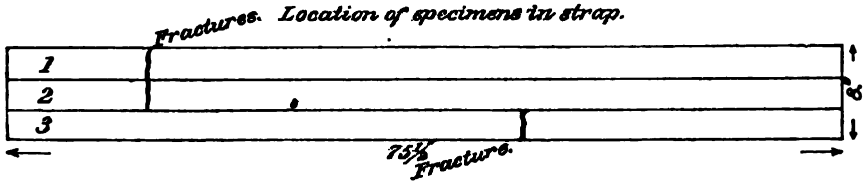
Area at fracture, 2″.22 × 1″.12 = 2.49 square inches.

Contraction of area, 14.1 per cent.

Appearance of fracture, fibrous 45 per cent., granular 55 per cent.

WROUGHT IRON MADE FROM COLD-BLAST CHARCOAL PIG.

Strap No. 2.



Three strips planed from original bar. Strips 1 and 3 sprung convex on the outside edges when cut up.

Strips warped before testing.

No. 574.

Mark 1.

Sectional area, 2''.29 × 1''.21 = 2.77 square inches.

Gauged length, 40''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 770	1, 000	0.	0.	0.	0.	Initial load.
13, 850	5, 000	.000152	.000152	.000025	.000025	
27, 700	10, 000	.000375	.000223	.000050	.000025	
41, 550	15, 000	.000610	.000235	.000100	.000050	
44, 000	....	.000670	.000060	....	....	
46, 000	....	.000700	.000030	....	....	
48, 000	....	.000738	.000038	....	....	
50, 000	....	.000793	.000055	....	....	
52, 000	....	.000850	.000057	....	....	
54, 000	....	.000905	.000055	....	....	
55, 400	20, 000	.000952	.000047	.000280	.000180	
56, 000	....	.001025	.000073	....	....	
58, 000	....	.001103	.000078	....	....	
60, 000	....	.001198	.000095	....	....	Elastic limit.
62, 000	....	.001485	.000287	....	....	
64, 000	....	.002125	.000640	....	....	
66, 000	....	.003375	.001250	....	....	
68, 000	....	.004025	.000650	....	....	
69, 250	25, 000	.005413	.001388	.004530	.004250	
72, 020	26, 000	.006413	.001000	....	....	
74, 790	27, 000	.009350	.002937	....	....	
77, 560	28, 000	.011000	.001650	....	....	
80, 330	29, 000	.014100	.003100	....	....	
83, 100	30, 000	.016438	.002338	....	....	
85, 870	31, 000	.018475	.002037	....	....	
88, 640	32, 000	.022875	.004400	....	....	
91, 410	33, 000	.0253	.002425	....	....	
94, 180	34, 000	.0290	.0037	....	....	
96, 950	35, 000	.0345	.0055	....	....	
99, 720	36, 000	.0365	.0020	....	....	
102, 490	37, 000	.0438	.0073	....	....	
105, 260	38, 000	.0478	.0040	....	....	
108, 030	39, 000	.0552	.0074	....	....	
110, 800	40, 000	.0612	.0060	....	....	
113, 570	41, 000	.0695	.0083	....	....	
116, 340	42, 000	.0778	.0083	....	....	
119, 110	43, 000	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ''.093.

Elongation of 5'' sections, ''.50, ''.80*, ''.50, ''.42, ''.40, ''.39, ''.39, ''.40, ''.41, ''.41.

Area at fracture, 2''.04 × 1''.07 = 2.18 square inches.

Contraction of area, 21.3 per cent.

Appearance of fracture, fibrous 100 per cent., lamellar.

Two specimens taken from end of bar 1, No. 574.

No. 574*a*.

Diameter, ″.564.
Sectional area, .25 square inch.
Tensile strength, 12,240 pounds = 48,960 pounds per square inch.
Contraction of area, 27.6 per cent.
Elongation in 2″, 25 per cent.
Appearance of fracture fibrous, lamellar.

No. 574*b*.

Diameter, ″.564.
Sectional area, .25 square inch.
Tensile strength, 12,080 pounds = 48,320 pounds per square inch.
Contraction of area, 33.5 per cent.
Elongation in 2″, 28 per cent.
Appearance of fracture fibrous, lamellar. A small piece flaked off in turning, owing to an imperfect weld in the rolling.

No. 575.

Mark, 2.

Sectional area, 2″.32 × 1″.21 = 2.81 square inches.
Gauged length, 40″.
Bar bent before the test. Micrometer on the convex side.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,810	1,000	0.	0.	0.	0.	Initial load.
14,050	5,000	.000123	.000123	−.000013	−.000013	
28,100	10,000	.000303	.000180	−.000025	−.000012	
42,150	15,000	.000480	.000177	....	....	
44,000	....	.000508	.000028	....	....	
46,000	....	.000522	.000014	....	....	
48,000	....	.000560	.000038	....	....	
50,000	....	.000578	.000018	....	....	
52,000	....	000620	.000042	....	....	
54,000	....	.000635	.000035	....	....	
56,200	20,000	.000725	.000070	.000050	.000075	
58,000	....	.000798	.000073	....	....	
60,000	21,350	.000873	.000075	....	....	Elastic limit.
62,000	....	.001010	.000137	....	....	
64,000	....	.001228	.000218	....	....	
66,000	....	.001493	.000265	....	....	
68,000	....	.002080	.000587	....	....	
70,230	25,000	.003350	.001270	.002463	.002413	
73,060	26,000	.004475	.001125	....	....	
75,870	27,000	.007075	.002600	....	....	
78,680	28,000	.009250	.002175	....	....	
81,490	29,000	.0118	.002550	....	....	
84,300	30,000	.0145	.0027	....	....	
87,110	31,000	.0178	.0033	....	....	
89,920	32,000	.0205	.0027	....	....	
92,730	33,000	.0240	.0035	....	....	
95,540	34,000	.0273	.0033	....	....	
98,350	35,000	.0315	.0042	....	....	
101,160	36,000	.0360	.0045	....	....	
103,970	37,000	.0420	.0060	....	....	
106,780	38,000	.0468	.0048	....	....	
109,590	39,000	.0518	.0050	....	....	
112,400	40,000	.0585	.0067	....	....	
115,210	41,000	.0663	.0078	....	....	

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
118,020	42,000	.0745	.0082	....	....	
120,830	43,000	.0850	.0105	....	....	
123,640	44,000	.0965	.0115	....	....	
126,450	45,000	.1038	.0073	....	....	
128,280	45,650	.1175	.0137	....	....	Tensile strength.

Elongation per inch after rupture, ″.127.

Elongation of 5″ sections, ″.68, ″.92*, ″.55, ″.49, ″.51, ″.51, ″.65, ″.68, ″.76, ″.85.

Area at fracture, 2″.10 × 1″.05 = 2.22 square inches.

Contraction of area, 21 per cent.

Appearance of fracture fibrous, laminated. A seam extends the width of the bar at the middle of its thickness.

Specimen taken from end of bar 2, No. 575.

No. 575*a*.

Diameter, ″.564.

Sectional area, .25 square inch.

Tensile strength, 11,750 pounds = 47,000 pounds per square inch.

Elongation in 2″, 26.5 per cent.

Diameter at fracture, ″.48.

Area, .181 square inch.

Contraction of area, 27.6 per cent.

Appearance of fracture fibrous, seamy.

Another specimen was turned down from end of bar No. 2, and a part of the threaded head came off at an imperfect weld in the rolling, unfitting the specimen for testing.

No. 576.

Mark, 3.

Sectional area, 2″.27 × 1″.20 = 2.72 square inches.

Gauged length, 40″.

Bar bent before the test.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,720	1,000	0.	0.	0.	0.	Initial load.
13,600	5,000	.000125	.000125	−.000015	−.000015	
27,200	10,000	.000298	.000173	−.000025	−.000010	
40,800	15,000	.000460	.000162	−.000025	0.	
42,000	....	.000480	.000020	....	....	
44,000	....	.000520	.000040	....	....	
46,000	....	.000545	.000025	....	....	
48,000	....	.000565	.000020	....	....	
50,000	....	.000590	.000025	....	....	
52,000	....	.000620	.000030	....	....	
54,400	20,000	.000660	.000040	−.000020	.000005	
56,000	....	.000713	.000053	....	....	
58,000	....	.000763	.000050	....	....	
60,000	....	.000828	.000065	....	....	
62,000	22,790	.000905	.000077	....	....	Elastic limit.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
64, 000	....	.001100	.000195	....	....	
66, 000	....	.001418	.000318	....	....	
68, 000	25, 000	.001975	.000557	.001118	.001138	
70, 000	....	.002875	.000900	....	....	
72, 000	....	.004050	.001175	....	....	
73, 440	27, 000	.005700	.001650	....	....	
76, 160	28, 000	.008000	.002300	....	....	
78, 880	29, 000	.0103	.0023	....	....	
81, 600	30, 000	.0128	.0025	....	....	
84, 320	31, 000	.0155	.0027	....	....	
87, 040	32, 000	.0188	.0033	....	....	
89, 760	33, 000	.0218	.0030	....	....	
92, 480	34, 000	.0260	.0042	....	....	
95, 200	35, 000	.0303	.0043	....	....	
97, 920	36, 000	.0348	.0045	....	....	
100, 040	37, 000	.0368	.0020	....	....	
103, 360	38, 000	.0440	.0072	....	....	
106, 080	39, 000	.0490	.0050	....	....	
108, 800	40, 000	.0550	.0060	....	....	Sustained load 8′.
111, 520	41, 000	.0553	.0003	....	....	
....	....	.0560	.0007	....	....	
114, 240	42, 000	.0708	.0148	....	....	
116, 960	43, 000	.0760	.0052	....	....	
119, 680	44, 000	.0863	.0103	....	....	
122, 200	....	.0930	.0067	....	....	
122, 400	45, 000	.0993	.0063	....	....	
124, 250	45, 680	.1143	.0150	....	....	Tensile strength.

Elongation per inch after rupture, ″.116.

Elongation of 5″ sections, ″.52, ″.51, ″.48, ″.48, ″.50, ″.52, ″.83*, ″.63, ″.69, ″.67.

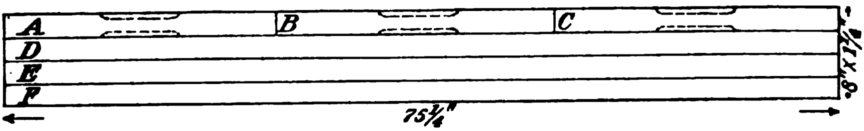
Area at fracture 2″.08 × 1″.06 = 2.20 square inches.

Contraction of area, 19.1 per cent.

Appearance of fracture fibrous, laminated, seamy.

Strap No. 3.

Location of specimens in strap.



No. 605.

Mark D.

Sectional area, 1''.92 × 1''.28 = 2.46 square inches.
Gauged length, 40''.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,460	1,000	0.	0.	0.	0.	Initial load.
12,300	5,000	.000133	.000133	0.	....	
24,600	10,000	.000323	.000190	—.000003	—.000003	
36,900	15,000	.000510	.000187	—.000003	0.	
38,000	....	.000525	.000015	....	....	
40,000	....	.000555	.000030	....	....	
42,000	....	.000580	.000025	....	....	
44,000	....	.000605	.000025	....	....	
46,000	....	.000650	.000045	....	....	
48,000	....	.000678	.000028	....	....	
49,200	20,000	.000700	.000022	.000005	.000008	
50,000	....	.000715	.000015	....	....	
51,000	....	.000730	.000015	....	....	
52,000	....	.000748	.000018	....	....	
53,000	....	.000770	.000022	....	....	
54,000	....	.000783	.000013	....	....	
55,000	....	.000803	.000020	....	....	
56,000	....	.000823	.000020	....	....	
57,000	....	.000845	.000022	....	....	
58,000	....	.000863	.000018	....	....	
59,000	....	.000880	.000017	....	....	
60,000	....	.000908	.000028	....	....	
61,000	24,800	.000928	.000020	....	....	Elastic limit.
61,500	25,000	.000953	.000025	.000080	.000075	
62,000	....	.000995	.000042	....	....	
63,000	....	.001033	.000038	....	....	
64,000	....	.001103	.000070	....	....	
65,000	....	.001173	.000070	....	....	
66,000	....	.001280	.000107	....	....	
66,420	27,000	.001530	.000250	....	....	
68,880	28,000	.005000	.003470	....	....	
71,340	29,000	.007350	.002350	....	....	
73,800	30,000	.009600	.002250	....	....	
76,260	31,000	.011650	.002050	....	....	
78,720	32,000	.013878	.002228	....	....	
81,180	33,000	.016925	.003047	....	....	
83,640	34,000	.019125	.002200	....	....	
86,100	35,000	.0230	.003875	....	....	
88,560	36,000	.0258	.0028	....	....	
91,020	37,000	.0303	.0045	....	....	
93,480	38,000	.0333	.0030	....	....	
95,940	39,000	.0395	.0062	....	....	
98,400	40,000	.0445	.0050	....	....	
100,860	41,000	.0503	.0058	....	....	
103,320	42,000	.0573	.0070	....	....	
105,780	43,000	.0625	.0052	....	....	
108,240	44,000	.0713	.0088	....	....	
110,700	45,000	.0803	.0090	....	....	
113,160	46,000	.0900	.0097	....	....	
115,620	47,000	.1063	.0163	....	....	
118,080	48,000	.1263	.0200	....	....	
120,200	48,860	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ''.147.

Elongation of inch sections, ''.70, ''.69, ''.69, ''.69, ''.75, ''.66, ''.73, 1''.03*, ''.63, ''.67.

Area at fracture, 1''.68 × 1''.08 = 1.81 square inches.

Contraction of area, 26.5 per cent.

Appearance of fracture fibrous, seamy.

No. 606.

Mark E.

Sectional area, 1″.92 × 1″.28 = 2.46 square inches.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2,460	1,000	0.	0.	0.	0.	Initial load.
12,300	5,000	.000133	.000133	0.	....	
24,600	10,000	.000328	.000195	0.	....	
36,900	15,000	.000513	.000185	.000003	.000003	
38,000	....	.000535	.000022	....	....	
40,000	....	.000560	.000025	....	....	
42,000	....	.000590	.000030	....	....	
44,000	....	.000620	.000030	....	....	
46,000	....	.000645	.000025	....	....	
48,000	....	.000673	.000028	....	....	
49,200	20,000	.000703	.000030	.000003	0.	
50,000	....	.000723	.000020	....	....	
51,000	....	.000743	.000020	....	....	
52,000	....	.000755	.000012	....	....	
53,000	....	.000770	.000015	....	....	
54,000	....	.000783	.000013	....	....	
55,000	....	.000805	.000022	....	....	
56,000	....	.000823	.000018	....	....	
57,000	....	.000848	.000025	....	....	
58,000	....	.000873	.000025	....	....	
59,000	....	.000893	.000020	....	....	
60,000	....	.000923	.000030	....	....	
61,000	24,800	.000948	.000025	....	....	Elastic limit.
61,500	25,000	.000968	.000020	.000095	.000092	
62,000	....	.001008	.000040	....	....	
63,000	....	.001053	.000045	....	....	
64,000	....	.001195	.000142	....	....	
65,000	....	.001488	.000293	....	....	
66,420	27,000	.002475	.000987	....	....	
68,880	28,000	.006625	.004150	....	....	
71,840	29,000	.008425	.001800	....	....	
73,800	30,000	.010675	.002250	....	....	
76,260	31,000	.012250	.001575	....	....	
78,720	32,000	.014550	.002300	....	....	
81,180	33,000	.017375	.002825	....	....	
83,640	34,000	.020700	.003325	....	....	
86,100	35,000	.023625	.002925	....	....	
88,560	36,000	.0270	.003375	....	....	
91,020	37,000	.0318	.0048	....	....	
93,480	38,000	.0355	.0037	....	....	
95,940	39,000	.0393	.0038	....	....	
98,400	40,000	.0450	.0057	....	....	
100,860	41,000	.0500	.0050	....	....	
103,320	42,000	.0575	.0075	....	....	
105,780	43,000	.0638	.0063	....	....	
108,240	44,000	.0728	.0090	....	....	
110,700	45,000	.0838	.0110	....	....	
113,160	46,000	.0950	.0112	....	....	
115,100	46,790	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ″.113.

Elongation of 5″ sections, ″.50, ″.50, ″.50, ″.48, 1″.10,* ″.47, ″.51, ″.48, ″.48, ″.48.

Area at fracture, 1″.71 × 1″.08 = 1.85 square inches.

Contraction of area, 24.8 per cent.

Appearance of fracture fibrous, seamy.

No. 607.

Mark F.

Sectional area, 1″.84 × 1″.28 = 2.36 square inches.
Gauged length, 40″.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
2, 360	1, 000	0.	0.	0.	0.	Initial load.
11, 800	5, 000	.000150	.000150	0.	....	
23, 600	10, 000	.000353	.000203	0.	....	
35, 400	15, 000	.000543	.000190	0.	....	
38, 000	....	.000580	.000037	....	....	
40, 000	....	.000618	.000038	....	....	
42, 000	....	.000643	.000025	....	....	
44, 000	....	.000670	.000027	....	....	
46, 000	....	.000708	.000038	....	....	
47, 200	20, 000	.000728	.000020	.000013	.000013	
48, 000	....	.000745	.000017	....	....	
49, 000	....	.000763	.000018	....	....	
50, 000	....	.000780	.000017	....	....	
51, 000	....	.000793	.000013	....	....	
52, 000	....	.000810	.000017	....	....	
53, 000	....	.000828	.000018	....	....	
54, 000	....	.000848	.000020	....	....	
55, 000	....	.000870	.000022	....	....	
56, 000	....	.000883	.000013	....	....	
57, 000	....	.000905	.000022	....	....	
58, 000	....	.000925	.000020	....	....	
59, 000	....	.000953	.000028	.000063	.000050	
60, 000	....	.000985	.000032	....	....	
61, 000	....	.001008	.000023	....	....	
62, 000	....	.001033	.000025	....	....	Elastic limit.
63, 000	....	.001068	.000035	....	....	
64, 000	....	.001100	.000032	....	....	
65, 000	....	.001195	.000095	....	....	
66, 000	....	.001613	.000418	....	....	
67, 000	....	.001825	.000212	....	....	
68, 440	29, 000	.005438	.003613	....	....	
70, 800	30, 000	.010125	.004687	....	....	
73, 160	31, 000	.011863	.001738	....	....	
75, 520	32, 000	.014713	.002850	....	....	
77, 880	33, 000	.016500	.001787	....	....	
80, 240	34, 000	.019250	.002750	....	....	
82, 600	35, 000	.022375	.003125	....	....	
84, 960	36, 000	.0265	.004125	....	....	
87, 320	37, 000	.0295	.0030	....	....	
89, 680	38, 000	.0338	.0043	....	....	
92, 040	39, 000	.0383	.0045	....	....	
94, 400	40, 000	.0425	.0042	....	....	
96, 760	41, 000	.0485	.0060	....	....	
99, 120	42, 000	.0550	.0065	....	....	
101, 480	43, 000	.0625	.0075	....	....	
103, 840	44, 000	.0700	.0075	....	....	
106, 200	45, 000	.0803	.0103	....	....	
108, 560	46, 000	.0938	.0135	....	....	
110, 920	47, 000	.1105	.0167	....	....	
113, 280	48, 000	.1313	.0208	....	....	
115, 280	48, 850	....	....	....	....	Tensile strength.

Elongation per inch after rupture, ″.163.

Elongation of 5-inch sections, ″.78, ″.79, ″.74, ″.80, 1″.04*, ″.83, ″.74, ″.76, ″.81, ″.78.

Area at fracture, 1″.67 × 1″.12 = 1.87 square inches.

Contraction of area, 20.8 per cent.

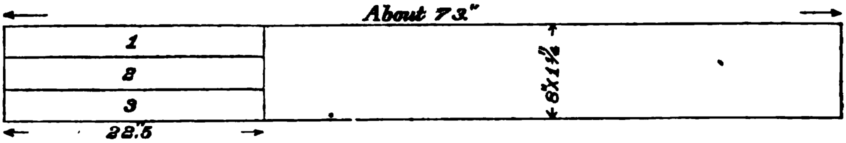
Appearance of fracture fibrous, seamy.

BARS A, B, AND C TURNED DOWN 6" IN LENGTH.

No. of test.	Mark on specimen.	Diameter.	Sectional area.	Elastic limit.	Ultimate strength.		Elongation in 6".	
					Total.	Per sq. in.		
		Inches.	*Sq. inch.*		*Pounds.*	*Pounds.*	*Inches.*	*Per cent.*
608	A.	1.129	1	Not determined	51,820	51,820	1.83	30.5
609	B.	1.129	1	....do	51,590	51,590	1.71	28.5
610	C.	1.129	1	....do	51,710	51,710	1.71	28.5

Area at fracture.		Contraction of area.	Appearance of fracture.	Elongation of 1" sections.
In.	*Sq. in.*	*Per cent.*		*Inch.*
.89	diameter=.622	37.8	Fibrous, seamy..................	.23, .56*, .33, .27, .24, .20
.90	diameter=.636	36.4	......do..........................	.22, .19, .66*, .24, .21, .19
.90	diameter=.636	36.4	......do..........................	.18, .25, .54*, .28, .24, .22

STRAPS NOS. 4 AND 5.



One bar without marks.
One bar marked U. S.

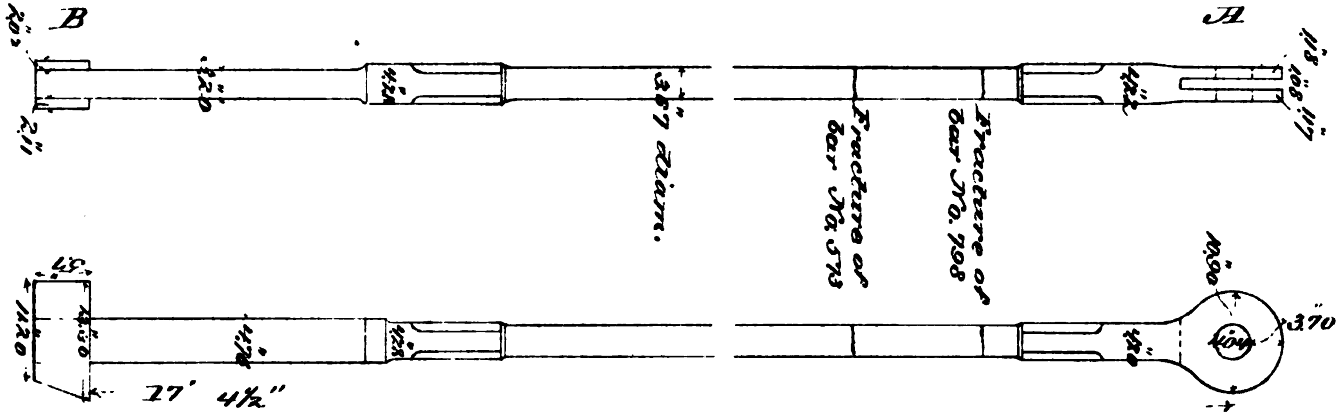
No. of test.	Mark on specimen.	Dimensions in inches.		Sectional area.	Elastic limit.		Ultimate strength.		Elongation in 10".	
		Width.	Thickness.		Total.	Per sq. in.	Total.	Per sq. in.		
		Inch.	*Inches.*	*Sq. inch.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*In.*	*Pr.ct.*
687	1	.620	1.20	.744	20,650	27,760	37,490	50,390	2.34	23.4
688	2	.620	1.20	.744	18,900	25,400	37,260	50,080	2.38	23.8
689	3	.625	1.21	.756	18,230	24,110	31,100	41,130	1.57	15.7
590	1. U. S.	.670	1.25	.837	22,100	26,400	45,800	54,720	2.03	20.3
691	2. U. S.	.670	1.25	.837	23,200	27,720	49,200	58,780	2.82	23.2
992	3. U. S.	.675	1.24	.837	22,600	27,000	48,710	58,200	2.18	21.8

Area at fracture.		Contraction of area.	Appearance of fracture.	Elongation of inch sections.
In.	*Sq.in.*	*Per cent.*		*Inch.*
.50×	.96=.480	35.5	Fibrous; layers of different-colored metal	.18, .17, .17, .17, .18, .20, .21, .33, .46*, .27
.54×1.00	=.540	27.4	Fibrous; seamy..........	.22, .24, .23, .20, .22, .27, .41*, .20, .20, .19
			Fibrous; opened at seam: 8" long × the width of the specimen..........	.06, .06, .12, .14, .11, .11, .23, .43*, .21, .10
.45×	.88=.396	52.7	Dull silky, slightly fibrous	.11, .11, .12, .14, .12, .17, .23, .67*, .21, .15
.45×	.88=.396	52.7	......do	.65*, .28, .21, .18, .16, .15, .17, .17, .16, .19
.47×	.88=.414	50.5	......do....................	.60*, .28, .23, .19, .17, .14, .14, .14, .13, .16

27.—TWO WROUGHT-IRON CHORD BARS FOR ROOF OF NEW PENSION BUILDING.

[General M. C. Meigs, architect.]

Sketch of Chord Bar for Roof Truss of New Pension Building.



S Ex 36 49 1

Secured in testing machine by a pin at end A, and pulling against blocks in front of cross-heads end B.

Nineteen 10″ sections laid off on stem, beginning at inside face of cross-heads.

No. 573.

Diameter of stem, 3″.67.

Sectional area of cylindrical stem, 10.58 square inches.

Gauged length, 100″, beginning 70″ from cross-heads on cylindrical stem.

Applied loads.		In gauged length.		Elongation center of pin hole to cross-heads.	Remarks.
Total.	Per square inch.	Elongation.	Set.		
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inches.*	
10,580	1,000	0.	0.	0.	Initial load.
52,900	5,000	.0160	.0010	.05	
105,800	10,000	.0348	.0015	.12	
158,700	15,000	.0550	.0030	.19	
165,000	....	.0590	....	....	
170,000	....	.0609	....	....	
175,000	....	.0631	....	....	
180,000	....	.0655	....	....	
185,000	....	.0683	....	....	
190,440	18,000	.0720	.0093	.24	
195,000	....	.0761	....	....	
200,000	....	.0791	....	....	
205,000	....	.0829	....	....	
210,000	....	.0865	....	....	
211,600	20,000	.0891	.0179	.27	″.06 set.
215,000	....	.0930	....	....	
220,000	....	.0970	....	....	
225,000	21,270	.1017	....	.29	Elastic limit.
230,000	....	.1089	....	....	
235,000	....	.1180	....	....	
240,000	....	.1320	....	.34	
245,000	....	.1430	....	....	
250,000	....	.1625	....	.39	
255,000	....	.1880	....	....	
260,000	....	.2240	....	.46	
264,500	25,000	.2730	.1824	.53	″.29 set.
275,080	26,000	....	....	.64	
285,660	27,000	....	....	.82	
296,240	28,000	....	....	1.02	
306,820	29,000	....	....	1.28	
317,400	30,000	....	....	1.61	
327,980	31,000	....	....	1.87	
338,560	32,000	....	....	2.25	
349,140	33,000	....	....	2.70	
359,720	34,000	....	....	3.14	
370,300	35,000	....	....	3.66	
					Rested under initial load one hour.
391,460	37,000	....	....	3.70	
395,500	37,380	....	....	....	Tensile strength.

Total elongation from center of pin hole to face of cross-heads, 3″.00 = 1.4 per cent.

Elongation of 10″ sections, beginning at cross-heads, ″.04, ″.03, ″.06, ″.08, ″.26, ″.23, ″.24, ″.24, ″.29, ″.22, ″.26, ″.15, ″.24, ″.20, ″.23, ″.17*, ″.11, ″.08, ″.02.

Elongations of pin holes, ″.13 each.

Diameter at fracture, 3″.63.

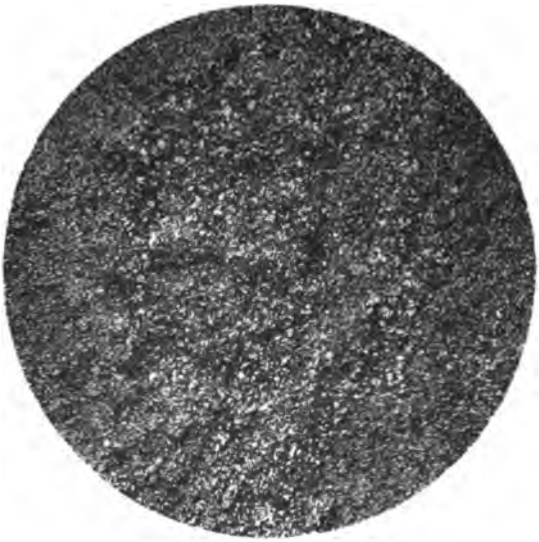
Area, 10.35.

Contraction of area, 2.2 per cent.

Fractured suddenly under the maximum load, 42¾″ from center of pin holes, accompanied by a loud report.

Appearance of fracture, granular 100 per cent.; coarse granulation at center, finer at circumference.

PHOTOGRAPH OF THE FRACTURE OF BAR No. 573.



S. Ex. 36, 49, 1.

No. 798.

Diameter of stem, 3''.75.

Sectional area of cylindrical stem, 11.04 square inches.

Gauged length 100'', beginning 70'' from cross-heads on cylindrical stem.

Applied loads.		In gauged length.		Elongation center of pin hole to cross-heads.	Remarks.
Total.	Per square inch.	Elongation.	Set.		
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inches.*	
11, 040	1, 000	0.	0.	0.	Initial load.
55, 200	5, 000	.0138	.0006	.08	
110, 400	10, 000	.0350	.0009	.14	
165, 600	15, 000	.0549	.0018	.20	.03 set.
198, 720	18, 000	.0668	.0015	.24	
220, 800	20, 000	.0749	.0022	.27	.06.
230, 000	....	.0789	....	....	
235, 000	....	.0809	....	....	
240, 000	....	.0829	....	.295	
245, 000	....	.0850	....	....	
250, 000	....	.0871	....	....	
255, 000	....	.0899	....	....	
260, 000	....	.0923	....	.34	
265, 000	....	.0953	....	....	
270, 000	24, 460	.0987	....	.36	Elastic limit.
276, 000	25, 000	.1039	.0123	.375	''.12
280, 000	....	.1100	....	.395	
285, 000	....	.1290	....	....	
290, 000	....	.1630	....	.48	
295, 000	....	.2028	....	....	
300, 000	....	.2940	....	.66	
305, 000	....	.4450	....	....	
310, 000	....	.7100	....	1.14	
320, 160	29, 000	....	....	1.48	
331, 200	30, 000	....	....	1.86	
342, 240	31, 000	....	....	2.15	
353, 280	32, 000	....	....	2.47	
364, 320	33, 000	....	....	2.90	
375, 360	34, 000	....	....	3.36	
386, 400	35, 000	....	....	3.77	
397, 440	36, 000	....	....	4.28	
408, 480	37, 000	....	....	4.87	Cracks in sight near ends of cylindrical stem, one 1⅜'' long, and one 1¼'' long, end A. Smaller cracks opened at end B.
419, 520	38, 000	....	....	5.52	
428, 200	38, 790	....	....	....	Tensile strength.

Total elongation from center of pin hole to face of cross-heads, 5''.16 = 2.45 per cent.

Total elongation in gauged length, 3''.39 = 3.39 per cent.

Elongation of 10'' sections, beginning at cross-heads, ''.02, ''.02, ''.07, ''.02, ''.14, ''.16, ''.27, ''.39, ''.39, ''.43, ''.41, ''.40, ''.38, ''.34, ''.42, ''.40, ''.37, ''.33, ''.20.

Elongation of pin holes, ''.27 each.

Diameter at fracture, 3''.91.

Bar fractured 28''.9 from center of pin holes end A, where cracks were developed earlier in the test.

Appearance of fracture, granular 92 per cent., fibrous 8 per cent.

COMPRESSION OF TWO 10" STEEL CHANNELS.

[Material for roof truss of the new Pension building.]

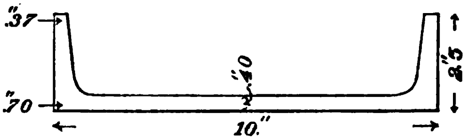
Ends of channels finished concave ".01.

Compression measurements taken in a gauged length (along center line of web) of 20".

Sectional areas computed as one-tenth the weight of channel per yard

No. 478.

Form of cross-section.

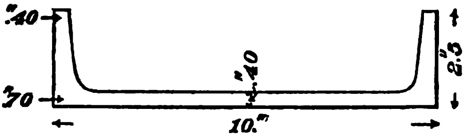


Length, 35".74.
Weight, 64½ pounds.
Sectional area, 6.5 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
6,500	1,000	0.	0.	Initial load.
32,500	5,000	.0021	0.	
65,000	10,000	.0054	0.	
97,500	15,000	.0088	0.	
130,000	20,000	.0122	0.	
135,000	....	.0127	....	
140,000	....	.0131	....	
145,000	....	.0136	....	
150,000	....	.0142	....	
155,000	....	.0148	....	
160,000	....	.0152	....	
162,500	25,000	.0156	0.	
165,000	....	.0159	....	
170,000	....	.0166	....	
175,000	....	.0171	....	
180,000	....	.0178	....	
185,000	....	.0183	....	
190,000	....	.0190	....	
195,000	30,000	.0199	.0003	
200,000	....	.0204	....	Scale starts off web and flanges.
205,000	....	.0209	....	
210,000	....	.0216	....	
215,000	....	.0222	....	
220,000	....	.0229	....	
225,000	....	.0238	....	
227,500	35,000	.0242	....	
230,000	....	.0246	....	
235,000	36,150	.0252	....	Elastic limit.
240,000	....	.0263	....	
245,000	....	.0277	....	
250,000	....	.0293	....	Web and flanges perceptibly buckled
255,000	....	.0319	....	
260,000	40,000	.0365	....	
265,000	....	.0420	....	
265,700	40,880	.0490	....	Ultimate strength. Failed by deflecting perpendicular to the plane of the web, and concave on the side of the flanges.

No. 479.

Form of cross-section.



Length, 35".75.
Weight, 64¼ pounds.
Sectional area, 6.47 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
6, 470	1, 000	0.	0.	Initial load.
32, 850	5, 000	.0021	0.	
64, 700	10, 000	.0052	0.	
97, 050	15, 000	.0084	0.	
129, 400	20, 000	.0118	0.	
135, 000	....	.0123	....	
140, 000	....	.0129	....	
145, 000	....	.0133	....	
150, 000	....	.0139	....	
155, 000	....	.0144	....	
160, 000	....	.0148	....	
161, 750	25, 000	.0151	0.	
165, 000	....	.0156	....	
170, 000	....	.0160	....	
175, 000	....	.0164	....	
180, 000	....	.0169	....	
185, 000	....	.0176	....	
190, 000	....	.0180	....	
194, 100	30, 000	.0183	0.	
200, 000	....	.0193	....	
205, 000	....	.0199	....	
210, 000	....	.0203	....	
215, 000	....	.0207	....	
220, 000	....	.0212	....	
225, 000	....	.0217	....	
226, 450	35, 000	.0220	0.	
230, 000	....	.0224	....	
235, 000	36, 320	.0229	....	Elastic limit. Scale starts off web and flanges.
240, 000	....	.0240	....	
245, 000	....	.0252	....	
250, 000	....	.0267	....	
255, 000	....	.0282	....	
258, 800	40, 000	.0293	.0035	
260, 000	....	.0300	....	
265, 000	....	.0329	....	
270, 000	....	.0361	....	Upward deflection observed at middle.
271, 100	41, 900	....	....	Ultimate strength.

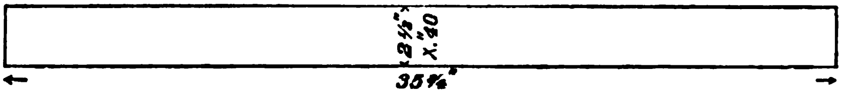
Failed by deflecting perpendicular to the plane of the web, and concave on the side of the flanges.

The maximum deflection occurred at a point 8" from the end of the bar.

Tension test of steel specimens cut from channel bars, previously tested by compression for General M. C. Meigs. (Nos. 478 and 479.) Material for new Pension building.

No. 629.

Form of specimens.



(From bar No. 478.)

Sectional area, 2''.50 × ''.40 = 1.00 square inch.
Rapid stretching began at 44,000 pounds.
Tensile strength, 73,410 pounds per square inch.
Load at time of rupture, 64,000 pounds.
Elongation in 15'', 3''.69 = 24.6 per cent.
Elongation of inch sections, ''.18, ''.18, ''.23, ''.29, ''.70*, ''.24, ''.22, ''.21, ''.24, ''.23, ''.23, ''.22, ''.21, ''.16, ''.15.
Area at fracture, 1''.94 × ''.28 = .543 square inch.
Contraction of area, 45.7 per cent.
Appearance of fracture, silky.

No. 630.

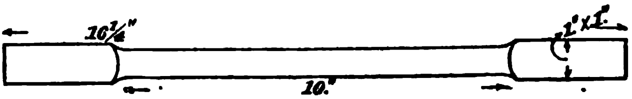
(From bar No. 479.)

Sectional area, 2''.50 × ''.40 = 1.00 square inch.
Rapid stretching began at 45,300 pounds.
Tensile strength, 73,940 pounds per square inch.
Load at time of rupture, 65,000 pounds.
Elongation in 15'', 3''.40 = 22.7 per cent.
Elongation of inch sections, ''.18, ''.16, ''.16, ''.17, ''.15, ''.18, ''.19, ''.20, ''.23, ''.30, ''.62*, ''.27, ''.22, ''.19, ''.18.
Area at fracture, 1''.97 × ''.30 = .591 square inch.
Contraction of area, 40.9 per cent.
Appearance of fracture, silky.

THREE WROUGHT-IRON BARS.

[Furnished by General M. C. Meigs, U. S. A.]

Form of Nos. 799 *and* 800.



No. 799.

Mark.

Diameter, ″.81; sectional area, .515 square inch.
Elastic limit, 17,950 pounds = 34,850 pounds per square inch.
Tensile strength, 28,620 pounds = 55,570 pounds per square inch.
Elongation in 10″, 2″.05 = 20.5 per cent.
Elongation of inch sections, ″.43*, ″.35, ″.22, ″.19, ″.17, ″.16, ″.15, .15, ″.13, ″.10.
Diameter at fracture, ″.57; area, .255 square inch.
Contraction, 50.5 per cent.
Appearance of fracture, fine fibrous.

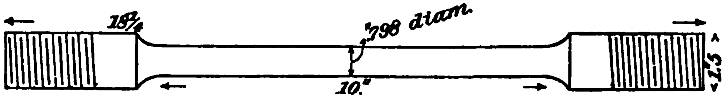
No. 800.

Mark . .

Diameter, ″.815; sectional area, .522 square inch.
Elastic limit, 18,300 pounds = 35,060 pounds per square inch.
Tensile strength, 29,260 pounds = 56,050 pounds per square inch.
Elongation in 10″, 2″.29 = 22.9 per cent.
Elongation of inch sections, ″.20, ″.59*, ″.30, ″.22, ″.20, ″.17, ″.17, ″.17, ″.15, ″.12.
Diameter at fracture, ″.58; area, .264 square inch.
Contraction, 49.4 per cent.
Appearance of fracture fine, fibrous.

No. 801.

Form of specimen.

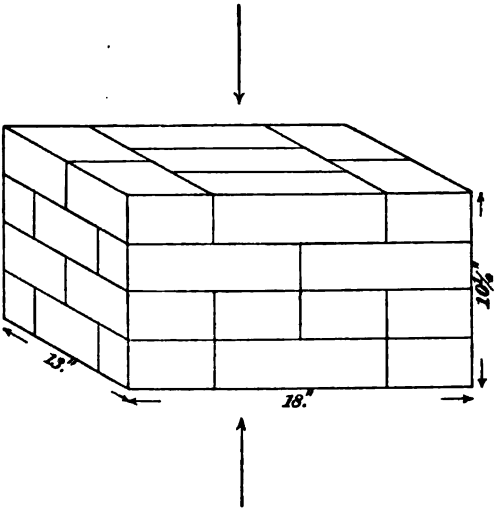


Sectional area, .50 square inch.
Elastic limit, 14,120 pounds = 28,240 pounds per square inch.
Tensile strength, 25,815 pounds = 51,630 pounds per square inch.
Elongation in 10″, 1″.97 = 19.7 per cent.
Elongation of inch sections, ″.17, ″.21, ″.21, ″.21, ″.21, ″.33*, ″.20, .15, ″15, ″.13.
Diameter at fracture, ″.68; area, .363 square inch.
Contraction, 27.4 per cent.
Appearance of fracture fibrous, spongy.

COMPRESSION OF BRICK WORK AND CONCRETE, SAID TO BE TWENTY-FIVE YEARS OLD.

[Furnished by General M. C. Meigs, U. S. A.]

No. 419.



Four courses of bricks laid in cement mortar. Average thickness of joints, ⅝".

Total weight, 178½ pounds.

Weight per cubic foot, 128.6 pounds.

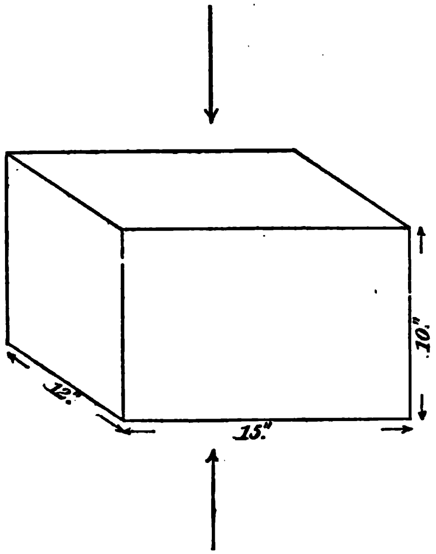
Bed surfaces faced with plaster of Paris to secure even bearings in testing-machine.

Compressed area, 234 square inches.

First crack at 360,000 pounds = 1,538 pounds per square inch.

Ultimate strength, 578,000 pounds = 2,470 pounds per square inch.

No. 420.



Irregular block of concrete, composed of cement mortar and broken stones.

Total weight, 150½ pounds.

Weight per cubic foot, 144.5 pounds.

Bed surfaces faced with plaster of Paris to secure even bearings in testing-machine.

Compressed area, 180 square inches.

First crack at 112,000 pounds = 622 pounds per square inch.

Ultimate strength, 135,300 pounds = 752 pounds per square inch.

No. 440.

($3\frac{1}{4}''$ steel-wire rope.)

6 strands of 7 wires each.
Length between sockets, 5′ 5″.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
5,000	0.	0.	Initial load.
10,000		.1120	
15,000		.2070	
20,000		.2960	
25,000		.3830	
30,000		.4700	
35,000		.5580	
40,000		.6540	
	2	.6700	
	4	.6800	
	6	.6870	
	8	.6920	
	10	.6960	
41,000		.7110	
42,000		.7240	
	2	.7335	
43,000		.7460	
	2	.7590	
44,000		.7710	
	2	.7840	
45,000		.7970	
	2	.8110	
	4	.8190	
	6	.8250	
	8	.8305	
	10	.8365	
46,000		.8490	
	2	.8570	
47,000		.8690	
	2	.8850	
48,000		.8990	
	2	.9210	
49,000		.9350	
	2	.9570	
50,000		.9742	
	2	.9970	
	4	1.0100	
	6	1.0205	
	8	1.0308	
	10	1.0385	
51,000		1.0515	
	2	1.0654	
52,000		1.0790	
	2	1.1060	
53,000		1.1300	
	2	1.1880	Rope struck with hand-spike and hammer.
	4	1.2340	
54,000		1.2515	
	2	1.2690	
55,000		1.2850	Solder started in south socket.
	2	1.3012	
	4	1.3170	
	6	1.3300	
	8	1.3440	Wire started at north end.
	10	1.3540	
56,000		1.3745	
	2	1.3888	
57,000		1.4055	
	2	1.4300	
58,000		1.4480	
	2	1.4875	
59,000		1.5130	Snapping sound.
	2	1.5510	
60,000		1.5750	
	2	1.6170	
	4	1.6410	
	6	1.6660	
	8	1.6840	

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
60,000	10	1.7060	
....	12	1.7385	
....	14	1.7615	
....	16	1.7820	
....	18	1.8100	
....	20	1.8350	
....	40	2.15	
65,000	....	....	
67,000	....	....	Maximum load applied.

The maximum load, 67,000 pounds, drew the rope rapidly from the north socket. Forty per cent. of the solder carried with the rope.

Rope in the south socket started ¼″.

No. 441.

(4″ iron-wire rope.)

6 strands of 7 wires each.
Length between sockets, 4′ 10″.
Length of rope in each socket, 8½″.

Applied loads.	Time under load and elongation.		Elongation in 50″ on rope.	Remarks.
	Time.	Elongation.		
Pounds.	*Minutes.*	*Inches.*	*Inch.*	
25,000	0.	0.	....	Initial load.
....	7	.0097	....	
....	15	.0145	....	
....	30	.0243	....	
Rested over night, 15 hours, under load.				
16,000	....	.0083	....	After 15 hours.
25,000	....	.0540	....	
....	19	.0572	0.	Initial reading on rope.
....	22	.0582	.0007	
....	25	.0582	.0007	
26,000	....	.0640	.0036	
....	2	.0643	.0039	
27,000	....	.0704	.0071	
....	2	.0714	.0076	
28,000	....	.0773	.0109	
....	2	.0781	.0111	
29,000	....	.0849	.0150	
....	2	.0869	.0159	
30,000	....	.0940	.0195	
....	2	.0960	.0205	
....	4	.0971	.0210	
....	6	.0983	.0213	
....	8	.0994	.0219	
....	10	.1001	.0220	Started in socket, north end.
....	15	.1004	.0221	
31,000	....	.1060	.0253	
....	2	.1078	.0260	
32,000	....	.1150	.0299	
....	2	.1184	.0310	
33,000	....	.1260	.0353	
....	2	.1296	.0368	
34,000	....	.1382	.0413	
....	2	.1420	.0428	
35,000	....	.1505	.0471	
....	2	.1548	.0490	
....	4	.1571	.0500	
....	6	.1590	.0503	
....	8	.1600	.0509	

Applied loads.	Time under load and elongation.		Elongation in 50″ on rope.	Remarks.
	Time.	Elongation.		
Pounds.	*Minutes.*	*Inches.*	*Inch.*	
....	10	.1614	.0512	
....	12	.1626	.0514	
....	14	.1638	.0518	
....	16	.1650	.0520	
35,000	18	.1658	.0521	
....	20	.1669	.0524	
....	22	.1678	.0525	
....	24	.1689	.0529	
....	26	.1696	.0530	
....	28	.1704	.0531	
....	30	.1713	.0532	
....	32	.1720	.0533	
....	34	.1731	.0535	
....	36	.1740	.0538	
....	38	.1747	.0539	
....	40	.1754	.0540	
36,000	....	.1817	.0570	
....	2	.1834	.0579	
37,000	....	.1924	.0621	
....	2	.1958	.0638	
38,000	....	.2050	.0678	
....	2	.2092	.0700	
39,000	....	.2190	.0745	
....	2	.2235	.0772	
40,000	....	.2338	.0820	
....	2	.2389	.0838	
....	4	.2420	.0847	
....	6	.2454	.0858	
....	8	.2480	.0862	
....	10	.2502	.0868	
41,000	....	.2600	....	
....	2	.2634	....	
42,000	....	.2730	....	
....	2	.2790	....	
43,000	....	.2889	....	
....	2	.2954	....	
44,000	....	.3042	....	
....	2	.3162	....	
45,000	....	.3260	....	
....	2	.3355	....	
46,000	....	.3455	....	
....	2	.3568	....	
47,000	....	.3662	....	
....	2	.3795	....	
48,000	....	.3905	....	
....	2	.4048	....	
49,000	....	.4190	....	
....	2	.4363	....	
50,000	....	.4470	....	
....	2	.4665	....	
....	4	.4785	....	
....	6	.4885	....	
....	8	.4095	....	
....	10	.5085	....	
....	12	.5158	....	
....	14	.5260	....	
50,000	16	.5375	....	
....	18	.5480	....	
....	20	.5598	....	
....	22	.5730	....	
....	24	.5870	....	
....	26	.6045	....	
....	28	.6215	....	
....	30	.6460	....	
....	32	.6720	....	
....	34	.7140	....	
....	36	.7520	....	
....	38	.8105	....	
....	40	.9260	....	
....	42	1.07	....	
....	44	1.35	....	
....	46	1.85	....	Out of socket 1¼″.

Rope drew out of socket at north end, carrying with it 60 per cent. of the solder.

Rope barely started in the south socket.

No. 442.

(3½″ iron-wire rope.)

6 strands of 7 wires each.
Length of rope between sockets, 5′ 1″.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
5,000	0	0.	Initial load.
20,000		.2530	
	2	.2670	
25,000		.4350	
	2	.4525	
30,000		.6020	
	2	.6248	
35,000		.7820	
	2	.8160	
38,000		.9500	
	2	1.0200	
	4	1.0394	
	6	1.0530	
	8	1.0640	
	10	1.0720	
	12	1.0778	
38,000	14	1.0830	
	16	1.0870	Began to draw in both sockets.
	18	1.0918	
	20	1.0950	
	22	1.0993	
	24	1.1025	
	26	1.1060	
	28	1.1090	
	30	1.1115	
	32	1.1147	
	34	1.1170	
	36	1.1197	
	38	1.1221	
	40	1.1242	
	42	1.1262	
	44	1.1285	
	46	1.1305	
	48	1.1331	
	50	1.1350	
	52	1.1368	
	54	1.1390	
	56	1.1410	
	58	1.1423	
	60	1.1447	
	62	1.1464	
	66	1.1490	
38,000	68	1.1507	
	70	1.1530	
	75	1.1570	
	81	1.1605	
39,000		1.1738	
	2	1.1860	
40,000		1.2520	
	2	1.3070	
41,000		1.4270	
	2	1.5560	
42,000		1.7400	
	2	2.07	
42,600			Ultimate strength of rope.

Parted one strand at face of socket. Rope started slightly in each socket.

No. 443.

(3½″ iron-wire rope.)

6 strands of 7 wires each.
Length between sockets, 5′ 3″.
Length of rope in each socket, 6¾″.

Applied loads.	Time under load and elongation.		Elongation in 8″, north socket and rope.	Remarks.
	Time.	Elongation.		
Pounds.	*Minutes.*	*Inch.*	*Inch.*	
20,000	0	0.		Initial load.
	5	.0083		
	10	.0159		
	15	.0210		
	20	.0243		
	25	.0273		
	30	.0300		
	35	.0322		
	40	.0350		
	45	.0305		
	50	.0388		
	55	.0405		
	60	.0418		
	65	.0430		
	70	.0440		
	75	.0447		
20,000	80	.0460		
	85	.0470		
	90	.0480		
	95	.0490		
	100	.0500		
	120	.0535		Rested 15 hours under load.
16,000				After 15 hours.
20,000		.0852		Evidence of drawing in north socket.
	5	.0883		
	10	.0890		
	15	.0899		
	20	.0908	0.	Initial reading for 8″ gauged length.
	25	.0918	.0004	
	30	.0921	.0006	
21,000		.1000	.0012	
	5	.1012	.0017	
22,000		.1118	.0025	
	5	.1142	.0030	
23,000		.1244	.0037	
	5	.1286	.0045	
24,000		.1404	.0065	
	5	.1458	.0074	
25,000		.1582	.0090	
	5	.1640	.0101	
26,000		.1762	.0121	
	5	.1832	.0131	
27,000		.1942		
	5	.2032		
28,000		.2152		
	5	.2240		
29,000		.2382		
	5	.2467		
30,000		.2608		
	5	.2718		
	10	.2796		
	15	.2835		
	20	.3487		Rope hammered with 6-pound hammer.
	25	.3970		Rope hammered with 6-pound hammer.

Removed from testing-machine at 11 a. m., November 22, 1884.

Again placed in testing-machine November 24, 1884, at 4.45 p. m., after a rest under zero load of 53 hours and 45 minutes.

30,000		.3970		
	5	.4075		
	10	.4131		
	15	.4178		
30,000	35	.4315		

The rope was left under strain 15 hours, during which time the load fell to 15,000 pounds. The rope started in each socket.

The full load, 30,000 pounds, again applied and maintained till the rope drew completely from one socket.

The following readings, showing the effect of the continued loading on the total elongation, and the additional time required to produce failure:

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
30,000	....	.5342	
....	15	.5378	
....	25	.5456	
....	35	.5516	
....	45	.5576	
....	50	.5644	
....	64	.5705	
....	70	.5752	
....	75	.5791	
....	85	.5860	Drawing rapidly in north socket.
30,000	95	.5923	
....	105	.6001	
....	115	.6094	
....	125	.6187	
....	135	.6292	
....	145	.6390	
....	155	.6503	
....	165	.6604	
....	175	.6776	
....	185	.6932	
....	195	.7097	
....	205	.7294	
....	215	.7522	
....	225	.7777	Rope drawn from north socket ¼″.
....	242	.8270	
....	253	.8782	
....	262	.9370	
....	272	1.0440	
....	282	1.1850	
....	292	1.3810	
....	302	1.6810	
....	312	2.2370	The speed with which the rope drew from the north socket continued to increase, while the load was still kept at 30,000 pounds till it had drawn 2¾″ from socket.

After this the rope was no longer able to sustain 30,000 pounds, but dropped rapidly as the rope drew from the socket. The rope at this end left the solder within the socket.

The total amount of drawing in the south socket was ¼″; in part the rope drew from the solder, and in part the solder was drawn with the rope from the socket.

No. 447.

(3½'' steel-wire rope.)

Length between sockets, 5' 3''.
Length of rope in each socket, 8½''.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
5,000	....	0.	Initial load.
10,000	....	.1284	
15,000	....	.2300	
20,000	....	.3225	
25,000	....	.3990	
30,000	....	.4845	
35,000	....	.5720	
40,000	....	.6610	
....	5	.6900	
....	10	.6980	
....	25	.7095	
28,000	....	.6920	After 15 hours rest under load.
40,000	....	.7840	
35,000	....	.7780	After 4 hours rest under load.
40,000	....	.8150	
35,000	....	.8100	After 4 hours rest under load.
40,000	....	.8471	
28,500	....	.8320	After 15 hours rest under load.
40,000	....	.9155	Rope drew $\frac{1}{16}$'' to $\frac{1}{16}$'' in north socket, started slightly in south socket.
....	8	.9208	
....	13	.9248	One wire broken at face of south socket.
....	18	.9260	
....	30	.9286	
....	60	.9362	
42,000	....	.9536	
....	5	.9575	
44,000	....	.9740	
....	5	.9802	
46,000	....	1.0006	
....	5	1.0218	
48,000	....	1.0690	
....	5	1.0832	
50,000	....	1.1198	
....	5	1.1338	
52,000	....	1.1725	
....	5	1.1900	
54,000	....	1.2294	
....	5	1.2472	
56,000	....	1.2860	
....	5	1.3068	
58,000	....	1.3495	
....	5	1.3772	
60,000	....	1.4180	
....	5	1.4509	
....	10	1.4666	
....	15	1.4842	
....	20	1.4992	
....	25	1.6464	Rope struck with 6-pound hammer.
....	30	1.6604	
....	35	1.6756	
....	40	1.6902	
....	45	1.7000	
....	50	1.7280	Sharp snapping sound.
....	60	1.7525	Broken wire in sight.
....	70	1.7845	
....	75	1.8052	
....	80	1.8284	
....	85	1.8520	

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
....	90	1.8810	
....	95	1.9070	
....	1.05	1.9560	Sharp snapping sound.
....	1.20	2.1642	Rapid drawing of the rope in each socket.

The rope finally drew from the south socket 1 hour and 40 minutes after rapid drawing in each socket began, and 45 hours from the time the first load was applied.

The speed at which the rope drew from the sockets was accelerated near the close of the test.

By employing a rapid movement of the piston of the straining-press, 60,000 pounds tension was kept on the rope till it had been drawn 1″ from the north socket and 2¾″ from the south socket.

The solder remained in the socket from which the rope was drawn.

Four broken wires were in sight after the test—two at the face of the south socket, one 6″ from this socket, and one at the face of the north socket.

No. 448.

(3″ iron-wire rope.)

6 strands of 7 wires each.
Length between sockets, 5′ 8″.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inch.*	
20,000	0	0.	Initial load.
....	5	.0295	
....	10	.0376	
....	15	.0450	
....	20	.0478	
....	25	.0517	
....	30	.0555	
....	35	.0572	
....	40	.0600	
....	45	.0614	
....	50	.0640	
....	55	.0656	
....	60	.0670	
....	65	.0685	
....	70	.0703	
....	75	.0726	
....	80	.0740	
20,000	85	.0756	
....	95	.0780	
....	105	.0808	
....	115	.0826	
....	125	.0841	
....	135	.0878	Removed from testing-machine.

Rested under zero load 24 hours, and again placed in the testing-machine.

20,000	....	.0873	
....	10	.0925	
....	20	.0968	
....	30	.0990	
....	50	.1027	
14,600	....	....	After 15 hours' rest under load.
20,000	....	.1410	Evidence of rope drawing in each socket.
....	10	.1448	
....	20	.1460	
....	30	.1479	
....	40	.1487	
....	50	.1499	
....	63	.1515	
....	70	.1525	
20,000	80	.1539	
....	90	.1551	
....	100	.1560	
....	110	.1571	
....	120	.1584	
....	130	.1596	
....	140	.1604	
....	150	.1615	
....	160	.1629	
....	170	.1643	
....	180	.1650	
....	190	.1671	
....	200	.1679	
....	210	.1694	
....	220	.1702	
....	278	.1773	
....	290	.1785	
....	300	.1794	
....	335	.1837	
....	365	.1879	
....	410	.1939	
....	425	.1964	
....	455	.2004	
....	485	.2047	
....	515	.2079	
18,900	....	....	After 15 hours' rest under load.
20,000	....	.2659	Rope has drawn in north socket.
17,900	....	....	After 4 hours' rest under load.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inches.*	
20,000	....	.2853	
17,000	....	....	After 5 hours' rest under load.
20,000	....	.3133	
13,400	....	....	After 15 hours' rest under load.
20,000	....	.3719	Rope has drawn in north socket ⅜".
....	10	.3765	
....	20	.3790	
....	50	.3878	
....	80	.3958	
....	110	.4058	
....	140	.4159	
....	155	.4208	
21,000	....	.4347	
....	5	.4396	
22,000	....	.4693	
....	5	.4815	
....	10	.7588	Rope hammered with 6-pound hammer.
23,000	....	.7689	
....	5	.7739	
....	8	.8550	Rope hammered with 6-pound hammer.
24,000	....	.9973	Do.
25,000	....	1.0133	
....	5	1.0235	
26,000	....	1.0468	
....	5	1.0661	
27,000	....	1.1600	
....	6	1.1988	
28,000	....	1.4673	
....	29	1.6578	
....	37	1.7093	Rope hammered with 6-pound hammer. Two strands parted at the middle of the length of the rope under the hammer.

The principal part of the drawing of the rope in the sockets occurred at the north end where the movement was ½". At the south end the movement was ¼".

No. 449.

(3½" steel-wire rope.

6 strands of 7 wires each.

Length between sockets, 5′ 4″.

Length of rope in each socket, 8½".

Loads immediately increased from zero to the breaking load.

Under 78,500 pounds tension the eye of the north socket (malleable iron 1".64 diameter, carrying a 1½" pin) fractured. The rope and solder started in the south socket.

The rope at the north end clamped in circular dies and the test resumed.

At 78,800 pounds the eye of the south socket fractured.

The total drawing in the south socket was ⅛", carrying the solder along with the rope. In the north socket the rope was not disturbed.

No. 450.

(3″ iron-wire rope.)

6 strands of 7 wires each.
Length between sockets, 5′ 8″.
Length of rope in each socket, about 6″.
Tested by the immediate application of the breaking load.
Tensile strength, 29,350 pounds.
Parted one strand 12″ from the face of the north socket.
Rope started slightly in each socket.

No. 451.

(1¾″ iron-wire rope.)

6 strands of 18 wires each.
Length between sockets, 5′ 8″.
Length of rope in each socket, about 4″.
Tested by the immediate application of the breaking load.
Tensile strength, 10,480 pounds.
Parted the rope at the face of the socket. Rope in the opposite socket not disturbed.

No. 452.

(1½″ iron-wire rope.)

6 strands of 7 wires each.
Length between sockets, 5′ 10″.
Length of rope in each socket, about 3″.
Tested by the immediate application of the breaking load.
Tensile strength, 6,080 pounds.
Parted 3 strands 1″ from the face of the socket.
Rope not disturbed in the sockets.

No. 453.

(1¾″ iron-wire rope.)

6 strands of 18 wires each.
Length between sockets, 5′ 1″.
Length of rope in each socket, about 4″.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inch.*	
6,000	0	0.	Initial load.
....	3	.0105	
7,000	....	.1110	
....	3	.1415	
8,000	....	.2651	
....	3	.3035	
9,000	....	.5030	
....	3	.5498	
10,000	....	.8920	
....	5	.9930	
10,580	....	....	Tensile strength.

Parted 3 strands.
Rope not disturbed in the sockets.

No. 454.

(1½″ iron-wire rope.)

Length between sockets 5′ 10″.
Length of rope in each socket, about 3½″.

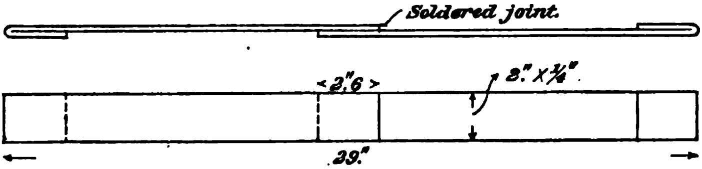
Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inch.*	
4,000		0.	Initial load.
	3	.0209	
5,000		.1560	
	3	.1915	
6,000		.6130	Tensile strength.

Snapping sounds were heard when 6,000 pounds tension were applied. After sustaining this load 2 minutes, 1 strand parted near the middle of the length of the rope.

Rope not disturbed in the sockets.

No. 455.

Tension test of two ¼″ iron plates soldered together with the same composition as used in the sockets.



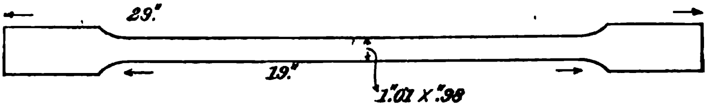
Area of soldered surface 5.2 square inches.
Gauged length, 10″.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inch.*	
500	0	0.	Initial load.
1,000		.0007	
	2	.0008	
1,500		.0013	
	2	.0014	
2,000		.0023	
	2	.0030	
2,250			Tensile strength of joint.

No. 456.

Tension test of the solder used in the sockets.

Composition said to be: Tin, 49; lead, 49; antimony, 2.



Sectional area, .99 square inch.
Gauged length, ''15.

Applied loads.	Time under load and elongation.		Remarks.
	Time.	Elongation.	
Pounds.	*Minutes.*	*Inch.*	
200	....	0.	Initial load.
400	....	.0004	
....	2	.0005	
600	....	.0011	
....	2	.0012	
800	....	.0021	
1,000	....	.0030	
1,200	....	.0041	
1,400	....	.0051	
1,600	....	.0062	
1,800	....	.0077	
2,000	....	.0089	
2,200	....	.0107	
2,400	....	.0120	
2,600	....	.0142	
2,800	....	.0157	
....	1	.0163	
3,000	....	.0180	
....	1	.0191	
3,200	....	.0220	
3,400	....	.0240	
....	1	.0258	
3,600	....	.0278	
3,800	....	.0305	
4,000	....	.0350	
....	1	.0390	
4,200	....	.0425	
....	1	.0468	
....	2	.0508	
4,400	....	.0543	
....	1	.0590	
....	2	.0650	
....	3	.0690	
....	4	.0730	
....	5	.0760	
4,400	6	.0800	
....	7	.0840	
....	8	.0885	
....	9	.0912	
4,600	....	.0948	
4,800	....	.0980	
5,000	....	.1047	
....	1	.1155	
5,200	....	.1325	
5,400	....	.1480	
5,600	....	.1690	
5,800	....	.1910	
6,000	....	.2310	
....	1	.2900	
6,200	....	.3300	
6,400	....	.3850	
6,540	....	....	Tensile strength = 6,606 pounds per square inch.

Ragged irregular fracture. Tore apart from one corner.
Time employed in making the test, 40'.

No. 431.

SPECIMENS WITH DEAD-EYE SOCKETS.

[Secured in testing-machine by pins passed through the dead-eyes.]

(4″ steel-wire rope.)

6 strands of 7 wires each, with hemp core.

It was intended to load the rope with 50,000 pounds tension and allow it to remain 40 hours.

At 47,500 pounds tension the socket of one dead eye pulled off.

The rope behind the socket at the fractured end now clamped in circular dies and the test resumed.

The 50,000 pounds tension was applied and left on the rope at the close of the day's work.

The following day (15 hours later) the load had fallen to 17,000 pounds. It was increased to 50,000 pounds and allowed to stand 4 hours more, when the rope was inspected and the load found at 17,000 pounds. 50,000 pounds again applied and 5 hours afterward (24 hours in all) load found at 17,000 pounds as before.

The fourth application of 50,000 pounds caused immediate yielding of the rope in the socket, and after standing 15 hours, making in all 39 hours from the time of the first application of 50,000 pounds, the load was found at 12,000 pounds, the rope in the mean time having drawn 1″ in the socket.

The load was again increased to 50,000 pounds, under which the rope slowly drew from the socket.

By a rapid application the load was increased to 60,700 pounds, the drawing out still going on, after which the rope was drawn out altogether from the socket.

A fracture was started at the base of the second socket in the malleable iron.

The soft solder employed in making this fastening appeared to fill all the interstices of the wire rope, but did not adhere to the wires. It could be readily flaked off with the hand.

Both ends of the rope were now held in circular dies.

Under 60,000 pounds three strands parted at the face of the dies. The grip apparently weakened the rope at this point.

No. 432.

(2½″ steel-wire rope.)

6 strands of 18 wires each, with hemp core.

Length, center to center of socket, 7′.

Length of socket, 4⅜″.

It was intended to apply a load of 25,000 pounds, and allow the rope to remain under tension a number of hours. When, however, this load was reached, the rope immediately drew from one socket.

The fractured end of rope was now held in semicircular dies and test resumed.

Gradually applying the load the rope began to draw from the socket. At 17,800 pounds tension it was drawn $\frac{3}{16}$″, and continued to yield. Then the load was suddenly increased to 26,600 pounds, for the purpose of ascertaining how much the apparent resistance could be increased by the rapid application of the loads. During this time the rope continued to draw from the socket, and finally drew out altogether from the socket.

Both ends of rope were now clamped in semicircular dies and again loaded.

At 28,800 pounds tension one strand parted at the face of the dies. Continuing the loads, under 25,500 pounds two other strands parted at the same place. The grip apparently weakened the rope at this point.

29.—HEMP AND MANILA CORDAGE.

Sixteen tests were made of rope manufactured at the Boston navy-yard, and the same number of tests of purchased rope, nominally of corresponding sizes.

The ends of the specimens were secured by taking one turn around a 6″ grooved iron pulley, and then fastening the end back of the pulley by a hitch. About 6′ of each rope was tested between pulleys.

The recorded elongations were measured in 4′ along the middle of the length.

CORDAGE MANUFACTURED AT THE BOSTON NAVY-YARD.

No. 1034.

(4½″ manila rope.)

3 strands of 58 yarns each.
60′; weight, 44 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.75	
3,000	2.10	
4,000	3.00	
5,000	3.75	
6,000	4.40	
6,800	4.62	
6,800	4.75	
7,000	4.90	
8,000	5.12	
9,000	5.37	
10,000	5.62	
14,900	....	Parted 1 strand at south pulley.

No. 1036.

(4½″ Russia hemp.)

3 strands of 69 yarns each.
60′; weight, 50 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.62	
4,000	1.88	
5,000	2.25	
6,000	2.50	
7,000	2.62	
8,000	2.88	
9,000	3.00	
10,000	3.12	
13,500	....	
20,030	....	Parted 1 strand at north pulley.

No. 1038.

(4″ Russia hemp rope.)

3 strands.
60′; weight, 40 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.37	
3,000	0.75	
4,000	1.25	
5,000	1.37	
6,000	1.62	
7,000	1.75	
8,000	1.88	
9,000	2.00	
10,000	2.12	
11,200	....	
15,400	....	Parted 1 strand at south pulley.

No. 1040.

(3½″ Russia hemp rope.)

3 strands of 43 yarns each.
60′; weight, 30 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.62	
3,000	1.12	
4,000	1.50	
5,000	1.88	
6,000	2.12	
7,000	2.37	
8,000	2.50	
9,000	2.62	
10,000	2.88	
10,800	....	Parted 1 strand at north pulley.
Second test to ascertain whether the turning of the pulley and hitch weakened the rope perceptibly.		
9,850	....	Parted 1 strand at the north pulley.

No. 1042.

(3″ Russia hemp rope.)

3 strands of 32 yarns each.
60′; weight, 22 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.50	
3,000	1.00	
4,000	1.37	
5,000	1.62	
6,000	1.88	
7,000	2.00	
8,000	2.25	
8,450	....	Parted 1 strand 2 feet from south pulley.

No. 1044.

(2½″ Russia hemp rope.)

3 strands of 22 yarns each.
60′; weight, 16 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.37	
4,000	1.88	
5,000	2.25	
5,100	....	Parted all 3 strands except 7 yarns at the middle of the length of the rope.

No. 1046.

(2″ Russia hemp rope.)

3 strands of 14 yarns each.
60′; weight, 9 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
500	0.	Initial load.
1,000	0.50	
1,500	0.88	
2,000	1.37	
2,500	1.75	
3,000	2.00	
3,960	....	Parted 1 strand 1 foot from north pulley.

No. 1048.

(3½″ Russia hemp bolt-rope).

3 strands of 53 yarns each.
60′; weight, 28 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.75	
3,000	1.12	
4,000	1.62	
5,000	1.75	
6,000	2.00	
7,000	2.13	
8,000	2.25	
9,000	2.37	
9,650	....	Parted 1 strand at north pulley.

No. 1050.

(3″ Russia hemp bolt-rope.)

3 strands of 38 yarns each.
60′; weight, 20 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.62	
3,000	1.00	
4,000	1.37	
5,000	1.62	
6,000	1.88	
7,000	2.00	
7,200	....	Parted 1 strand 2 feet from south pulley.

No. 1052.

(2½″ Russia hemp bolt-rope.)

3 strands of 27 yarns each.
60′; weight, 14 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.37	
4,000	1.75	
5,000	2.25	
5,180	....	Parted 1 strand at the middle the length of the rope.

No. 1054.

(4″ manila rope.)

3 strands of 49 yarns each.
60′; weight, 28 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.75	
3,000	1.62	
4,000	2.40	
4,900	3.00	
5,000	3.12	
6,000	3.75	
7,000	4.12	
8,000	4.75	
9,000	5.37	
10,000	5.62	
12,960	....	Parted 1 strand at south pulley.

No. 1056.

(3½″ manila rope.)

3 strands of 39 yarns each.
60′; weight, 22 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.37	
4,000	2.00	
5,000	2.75	
6,000	3.00	
7,000	3.37	
8,000	3.50	
9,000	3.75	
10,000	4.00	
11,200	....	Parted 1 strand at the north pulley.

No. 1058.

(3″ manila rope.)

3 strands of 27 yarns each.
60′; weight, 14 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.50	
3,000	2.75	
4,000	3.62	
5,000	4.12	
6,000	4.75	
7,000	5.00	
8,000	5.75	
9,000	5.78	
9,050	....	Parted 1 strand at north pulley.

No. 1060.

(2½″ manila rope.)

3 strands of 18 yarns each
60′; weight, 10 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.88	
3,000	3.00	
4.000	3.75	
5,000	4.37	
6,000	4.62	
7,460	....	Parted 1 strand at north pulley.

No. 1062.

(2″ manila rope.)

3 strands of 12 yarns each.
60′; weight, 6 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
500	0.	Initial load.
1,000	1.50	
1,500	2.88	
2,000	3.37	
2,500	4.25	
3,000	4.62	
3,400	5.00	
3,500	5.25	
4,000	5.75	
4,270	....	Parted 1 strand 8″ from south pulley.

CORDAGE PURCHASED BY THE NAVY DEPARTMENT.

No. 1035.

(4½″ manila rope.)

3 strands of 46 yarns each.
50′; weight, 31 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	
2,000	1.00	
3,000	1.88	
4,000	2.62	
5,000	3,37	
6.000	3.75	
6,000	3.88	
7,000	4.25	
8,000	4.60	
9,000	5.00	
10,000	5.25	
13,480	....	Parted 1 strand at south pulley.

No. 1037.

(4½″ hemp rope.)

3 strands of 47 yarns each.
50′; weight, 43 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial loads.
2,000	0.88	
3,000	1.37	
4,000	1.62	
5,000	2.00	
6,000	2.25	
7,000	2.37	
8,000	2.62	
9,000	2.75	
9,200	....	
10,000	3.00	
13,500	....	Parted 1 strand at south pulley.

No. 1039.

(4½″ hemp rope.)

3 strands of 37 yarns each.
50′; weight, 33 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.12	
4,000	1.62	
5,000	2.00	
6,000	2.25	
7,000	2.37	
8,000	2.62	
9,000	2.75	
9,500	....	
10,000	2.75?	Gauge points probably shifted.
11,400	....	Parted 1 strand at north pulley.

No. 1041.

(3½″ hemp rope.)

3 strands.
50′; weight, 24 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.75	
3,000	1.25	
4,000	1.62	
5,000	1.88	
6,000	2.12	
7,000	2.37	
8,000	2.62	
9,000	2.88	
10,000	3.00	
10,300	....	Parted 1 strand at north pulley.

Second Test.

9,400	....	Parted 1 strand at north pulley.

No. 1043.

(3″ hemp rope.)

3 strands of 21 yarns each.
50′; weight, 18 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.50	
4,000	1.88	
5,000	2.25	
6,000	2.50	
7,000	2.88	
7,200	....	Parted 1 strand at south pulley.

No. 1045.

(2½″ hemp rope.)

3 strands, 15 yarns each.
50′; weight, 13 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.00	
3,000	1.62	
4,000	2.00	
5,150	....	Parted 1 strand at north pulley.

No. 1047.

(2″ hemp rope.)

3 strands of 10 yarns each.
50′; weight, 9 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
500	0.	Initial load.
1,000	1.37	
1,500	2.00	
2,000	2.12	
2,500	2.62	
2,640	....	Parted 1 strand 6″ from south pulley.

No. 1049.

(3½″ hemp bolt-rope.)

3 strands of 41 yarns each.
50′; weight, 20 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.62	
3,000	1.12	
4,000	1.62	
5,000	1.88	
6,000	2.25	
7,000	2.50	
8,000	2.75	Parted 1 strand at south pulley.

No. 1051.

(3″ hemp rope.)

3 strands of 30 yarns each.
50′; weight, 15 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.62	
4,000	2.00	
5,000	2.37	
6,000	2.88	
6,680	....	Parted 1 strand at north pulley.

No. 1053.

(2½″ hemp bolt-rope.)

3 strands of 22 yarns each.
50′; weight, 11 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.25	
3,000	2.00	
4,000	2.62	
4,620	....	Parted 1 strand at north pulley.

No. 1055.

(4″ manila rope.)

3 strands of 38 yarns each.
50′; weight, 26 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.25	
3,000	2.37	
4,000	3.25	
5,000	3.75	
6,000	4.25	
7,000	4.75	
8,000	5.25	
9,000	5.50	
10,000	5.75	
11,950	....	Parted 1 strand at north pulley.

No. 1057.

(3½″ manila rope.)

3 strands of 39 yarns each.
50′; weight, 20 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	0.88	
3,000	1.88	
4,000	2.62	
5,000	3.25	
6,000	3.75	
7,000	4.12	
8,000	4.62	
9,000	4.75	
10,000	5.12	
10,750	....	Parted 1 strand at north pulley.

No. 1059.

(3″ manila rope.)

3 strands of 23 yarns each.
50′; weight, 15 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	Initial load.
2,000	1.62	
3,000	3.25	
4,000	4.37	
5,000	5.00	
6,000	5.62	
7,000	6.25	
7,300	....	Parted 1 strand at north pulley.

No. 1061.

(2½″ manila rope.)

3 strands of 16 yarns each.
54′; weight, 11 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
1,000	0.	
2,000	1.75	
3,000	3.12	
4,000	4.00	
4,800	4.50	
5,000	4.88	
6,000	....	Parted 1 strand at north pulley.

No. 1063.

(2″ manila rope.)

3 strands of 11 yarns each.
50′; weight, 7 pounds.

Applied loads.	Elongation in 4′.	Remarks.
Pounds.	*Inches.*	
500	0.	Initial load.
1,000	2.25	
1,500	3.62	
2,000	4.62	
2,500	5.25	
2,700	5.75	
3,000	6.00	
3,500	....	Parted 1 strand at north pulley.

Tabulation of tensile strength of hemp and manila cordage.

No. of test.	Kind of rope.	Circumference.	Tensile strength.	Manner of failure.
		Inches.	*Pounds.*	
1034	Manila from Boston navy-yard	4½	14,900	Parted 1 strand at south pulley.
1035	Manila purchased	4½	13,480	Do.
1036	Hemp from Boston navy yard	4½	20,050	Parted 1 strand at north pulley.
1037	Hemp purchased	4½	13,500	Parted 1 strand at south pulley.
1038	Hemp from Boston navy-yard	4	15,400	Do.
1039	Hemp purchased	4	11,400	Parted 1 strand at north pulley.
1010	Hemp from Boston navy-yard	3½	10,300	Do.
	Second test		9,350	Do.
1041	Hemp purchased	3½	10,300	Do.
	Second test		9,400	Do.
1042	Hemp from Boston navy-yard	3	8,450	Parted 1 strand 2' from south pulley.
1043	Hemp purchased	3	7,200	Parted 1 strand at south pulley.
1044	Hemp from Boston navy-yard	2½	5,100	Parted all 3 strands at middle of length, except 7 yarns.
1045	Hemp purchased	2½	5,150	Parted 1 strand at north pulley.
1046	Hemp from Boston navy-yard	2	3,960	Parted 1 strand 1' from north pulley.
1047	Hemp purchased	2	2,640	Parted 1 strand 6'' from south pulley.
1048	Hemp bolt-rope from Boston navy-yard	3½	9,650	Parted 1 strand at north pulley.
1019	Hemp bolt-rope purchased	3½	8,000	Parted 1 strand at south pulley.
1050	Hemp bolt-rope from Boston navy-yard	3	7,200	Parted 1 strand 2' from south pulley.
1051	Hemp bolt-rope purchased	3	6,680	Parted 1 strand at north pulley.
1052	Hemp bolt-rope from Boston navy-yard	2½	5,180	Parted 1 strand at the middle the length of the rope.
1053	Hemp bolt-rope purchased	2½	4,6[illegible]0	Parted 1 strand at north pulley.
1054	Manila from Boston navy-yard	4	12,960	Parted 1 strand at south pulley.
1055	Manila purchased	4	11,980	Parted 1 strand at north pulley.
1056	Manila from Boston navy-yard	3½	11,200	Do.
1057	Manila purchased	3½	10,750	Do.
1058	Manila from Boston navy-yard	3	9,650	Do.
1059	Manila purchased	3	7,300	Do.
1060	Manila from Boston navy-yard	2½	7,460	Do.
1061	Manila purchased	2½	6,000	Do.
1062	Manila from Boston navy-yard	2	4,270	Do.
1063	Manila purchased	2	3,500	Do.

30.—O. H. STEEL BOILER PLATE, UNANNEALED BARS.

No. 587.

($\frac{1}{4}''$ plate.)

Sectional area, $1''.63 \times ''.244 = .398$ square inch.
Gauged length, $10''$.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
373	937	0.	0.	Initial load.
1, 865	4, 686	.0016		
3, 730	9, 372	.0031		
5, 595	14, 058	.0049		
7, 460	18, 744	.0061		
9, 325	23, 430	.0078		
11, 190	28, 116	.0094		
12, 000		.0101		
12, 200		.0105		
12, 400		.0106		
12, 600		.0108		
12, 800		.0110		
13, 000		.0112		
13, 200		.0114		
13, 400		.0116		
13, 600		.0118		
13, 800		.0120		
14, 000		.0122		
14, 200		.0124		
14, 400		.0125		
14, 600		.0127		
14, 800		.0129		
15, 000		.0130		
15, 200		.0133		
15, 400		.0136		
15, 600		.0138		
15, 800		.0141		
16, 000		.0145		
16, 200	40, 700	.0149		Elastic limit.
16, 400		.0161		
16, 600		.0194		
16, 800		.0520		
17, 000		.1280		
17, 200		.2000		
17, 400		.2850		
17, 600		.2940		
17, 800		.3000		
18, 000		.3100		
18, 200		.3200		
18, 400		.3300		
18, 600		.3450		
18, 800		.3790		
19, 000		.3900		
19, 200		.4050		
19, 400		.4190		
19, 600		.4355		
19, 800		.4560		
20, 000		.50		
20, 200		.52		
20, 400		.54		
20, 600		.56		
20, 800		.59		
21, 000		.61		
21, 200		.65		
21, 400		.68		
21, 600		.70		
21, 800		.74		
22, 000		.78		
22, 200		.82		
22, 400		.87		
22, 600		.92		

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pound.*	*Inches.*	*Inches.*	
22,800	....	.98	....	
23,000	....	1.05	....	
23,200	....	1.14	....	
23,400	....	1.23	....	
23,600	....	1.35	....	
23,800	....	1.58	....	
24,000	....	1.70	....	
24,110	60,580	2.18	....	Tensile strength.

Elongation after rupture, 2''.65 = 26.5 per cent.

Elongation of inch sections, ''.21, ''.19, ''.19, ''.18, ''.19, ''.22, ''.24, ''.34, ''.47*, ''.26, ''.21, ''.18, ''.19, ''.26, ''.28, ''.21, ''.22, ''.21, ''.21, ''.20.

Area at fracture, 1''.37 × ''.17 = .233 square inch.

Contraction at area, 41.5 per cent.

Appearance of fracture silky, lamellar.

No. 588.

(½″ plate.)

Sectional area 1″.628 × ″.460 = .749 square inch.
Gauged length, 10.″

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Sot.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
749	1,000	0.	0.	Initial load.
3,745	5,000	.0011	....	
7,490	10,000	.0028	....	
11,235	15,000	.0047	....	
14,980	20,000	.0063	....	
18,725	25,000	.0079	....	
22,470	30,000	.0094	....	
23,000	....	.0097	....	
23,400	....	.0099	....	
23,800	....	.0101	....	
24,200	....	.0103	....	
24,600	....	.0105	....	
25,000	....	.0107	....	
25,400	....	.0109	....	
25,800	....	.0110	....	
26,200	....	.0112	....	
26,400	....	.0113	....	
26,600	....	.0114	....	
26,800	....	.0116	....	
27,000	....	.0118	....	
27,200	....	.0120	....	
27,400	36,580	.0121	....	Elastic limit.
27,600	....	.0600	....	
27,800	....	.0745	....	
28,000	....	.0768	....	
28,400	....	.0800	....	
28,800	....	.0960	....	
29,200	....	.1095	....	
29,600	....	.1215	....	
30,000	....	.1550	....	
31,000	....	.18	....	
32,000	....	.25	....	
33,000	....	.34	....	
34,000	....	.40	....	
35,000	....	.44	....	
36,000	....	.49	....	
37,000	....	.57	....	
38,000	....	.63	....	
39,000	....	.71	....	
40,000	....	.82	....	
41,000	....	.95	....	
42,000	....	1.14	....	
42,910	57,290	1.58	....	Tensile strength.

Elongation after rupture 2″.29 = 22.9 per cent.
Elongation of inch sections, ″.67*, ″.22, ″.19, ″.19, ″.17, ″.20, ″.17, ″.18, ″.16, ″.14, ″.12, ″.14, ″.13, ″.14, ″.16, ″.15, ″.18, ″.18, ″.15, ″.15.
Area at fracture 1″.22 × ″.32 = .390 square inch.
Contraction of area, 47.9 per cent.
Appearance of fracture silky, lamellar.

No. 589.

($\frac{13}{16}''$ plate.)

Sectional area, 1''.630 × ''.842 = 1.37 square inches.
Gauged length, 10''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Elongation.	Set.	
Pounds.	*Pounds.*	*Inches.*	*Inch.*	
1, 370	1, 000	0.	0.	Initial load.
6, 850	5, 000	.0015		
13, 700	10, 000	.0032		
20, 550	15, 000	.0051		
27, 400	20, 000	.0067		
34, 250	25, 000	.0087		
34, 600		.0088		
35, 000		.0089		
35, 400		.0090		
35, 800		.0092		
36, 200		.0093		
36, 600		.0095		
37, 000		.0096		
37, 400		.0097		
37, 800		.0098		
38, 200		.0099		
38, 600		.0100		
39, 000		.0100		
39, 400		.0101		
39, 800		.0102		
40, 200		.0103		
40, 600		.0104		
41, 000		.0105		
41, 400		.0106		
41, 800		.0107		
42, 200		.0108		
42, 600		.0110		
43, 000		.0111		
43, 400		.0112		
43, 800		.0113		
44, 200		.0114		
44, 600		.0115		
45, 000		.0115		
45, 400		.0117		
45, 800		.0118		
46, 200	33, 720	.0121		Elastic limit.
46, 600		.0134		
47, 000		.0175		
47, 400		.0255		
47, 800		.0490		
48, 000		.0720		
49, 000		.1272		
50, 000		.1550		
52, 000		.1955		
54, 000		.2200		
56, 000		.27		
58, 000		.30		
60, 000		.38		
62, 000		.41		
64, 000		.44		
66, 000		.48		
68, 000		.55		
70, 000		.60		
72, 000		.61		
74, 000		.73		
76, 000		.85		
78, 000		.96		
80, 000		1.24		
80, 380	58, 670	1.35		Tensile strength.

Elongation after rupture, 1''.88 = 18.8 per cent.
Elongation of inch sections, ''.54* ''.25, ''.16, ''.15, ''.16, ''.13, ''.14, ''.13, ''.10, ''.12, ''.11, ''.12, ''.14, ''.14, ''.14, ''.11, ''.13, ''.13, ''.11, ''.14.
Area at fracture, 1''.32 × ''.63 = .832 square inch.
Contraction of area, 39.3 per cent.
Appearance of fracture silky, lamellar, stratified.

31.—PHOSPHOR BRONZE.

[Specimen turned down from bar 1" in diameter.]

No. 427.

Tension Test.

Diameter, ".564.
Sectional area, .25 square inch.
Gauged length, 3".00.

Applied loads.		Elongation per inch.	Successive elongation per inch.	Permanent set.	Successive permanent set.	Remarks.
Total.	Per square inch.					
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	
250	1,000	0.	0.	0.	0.	Initial load.
1,250	5,000	.000233	.000233	0.	....	
2,500	10,000	.000533	.000300	0.	....	
3,750	15,000	.000800	.000267	0.	....	
5,000	20,000	.001100	.000300	0.	....	
6,250	25,000	.001333	.000233	0.	....	
7,500	30,000	.001633	.000300	0.	....	
7,750	31,000	.001667	.000034	....	....	
8,000	32,000	.001767	.000100	....	....	
8,250	33,000	.001800	.000033	....	....	
8,500	34,000	.001867	.000067	....	....	
8,750	35,000	.001933	.000066	.000033	.000033	
9,000	36,000	.001967	.000034	....	....	
9,250	37,000	.002067	.000100	....	....	
9,500	38,000	.002133	.000066	....	....	
9,750	39,000	.002167	.000034	....	....	
10,000	40,000	.002200	.000033	.000067	.000067	
10,250	41,000	.002300	.000100	....	....	
10,500	42,000	.002333	.000033	....	....	
10,750	43,000	.002367	.000034	....	....	
11,000	44,000	.002467	.000100	....	....	
11,250	45,000	.002500	.000033	.000067	0.	
11,500	46,000	.002533	.000033	....	....	
11,750	47,000	.002600	.000067	....	....	
12,000	48,000	.002667	.000067	....	....	
12,250	49,000	.002700	.000033	....	....	
12,500	50,000	.002800	.000100	.000100	.000033	
12,750	51,000	.002833	.000033	....	....	
13,000	52,000	.002933	.000100	....	....	
13,250	53,000	.002967	.000034	....	....	
13,500	54,000	.003000	.000033	....	....	
13,750	55,000	.003133	.000133	.000167	.000067	
14,000	56,000	.003200	.000067	....	....	
14,250	57,000	.003267	.000067	....	....	Elastic limit.
14,500	58,000	.003400	.000133	....	....	
14,750	59,000	.003600	.000200	....	....	
15,000	60,000	.003800	.000200	.000500	.000333	
15,250	61,000	.004033	.000233	....	....	
15,500	62,000	.004633	.000600	....	....	
15,750	63,000	.005367	.000734	....	....	Micrometer removed.
16,000	64,000	.0300	.024633	....	....	
16,250	65,000	.0867	.0567	....	....	
16,360	65,440	.1867	.1000	....	....	
16,440	65,760	.2033	.0166	....	....	Ultimate strength.
11,000	....	....	....	....	....	Load at time of rupture.

General summary.

Tensile strength per square inch of original section	pounds..	65,760
Elastic limit per square inch of original section	do....	57,000
Elongation per inch after rupture	inch..	0.3133
Elongation per inch under strain at elastic limit	do....	.003267
Reduction in diameter at point of rupture	do....	.234
Reduction in area after rupture, per cent. of original section		65.8
Position of rupture		at middle of stem

Character of broken surface, fine silky. Separation occurred in a spiral plane. A number of small holes in the center of the fractured surface.

Elongation of inch sections..".16 (".61 fractured section), ".17

32.—COTTON CLOTH.

Samples of cotton cloth tested in strips 2″ wide, with a length of 12′ between the holder jaws of testing-machine.

Strips cut crosswise the cloth and parallel to the filling.

Each end of the samples were held in the testing machine by being compressed between pine cushions.

Manufacturers' marks.	Tensile strength.	Mean tensile strength.
Manufacturer A:	*Pounds.*	
Item No. 1	202	202
Do	203	
Do	202	
Item No. 2	201	190
Do	174	
Do	194	
Item No. 3	163	153
Do	145	
Do	153	
Item No. 4	169	196
Do	205	
Do	215	
Item No. 5	194	196
Do	[illegible]	
Do	202	
Item No. 6	129	143
Do	152	
Do	147	
Pequot	126	133
Do	126	
Do	146	
Manufacturer B:		
Item No. 1	157	147
Do	139	
Do	144	
Item No. 2	158	155
Do	152	
Do	156	
Item No. 3	161	170
Do	174	
Do	174	
Item No. 4	172	161
Do	174	
Do	138	
Item No. 5	189	187
Do	175	
Do	197	
Item No. 6	160	173
Do	182	
Do	176	
Manufacturer C:		
Item No. 1, twilled	145	140
Do	147	
Do	127	
Item No. 2, twilled	136	124
Do	115	
Do	120	
Item No. 4, twilled	105	121
Do	124	
Do	135	
Item No. 5, twilled	129	123
Do	123	
Do	118	
Manufacturer D:		
Item No. 1, plain	162	152
Do	149	
Do	144	
Item No. 2, plain	151	141
Do	116	
Do	155	
Item No. 3, plain	155	145
Do	144	
Do	136	
Item No. 4, plain	127	140
Do	152	
Do	142	

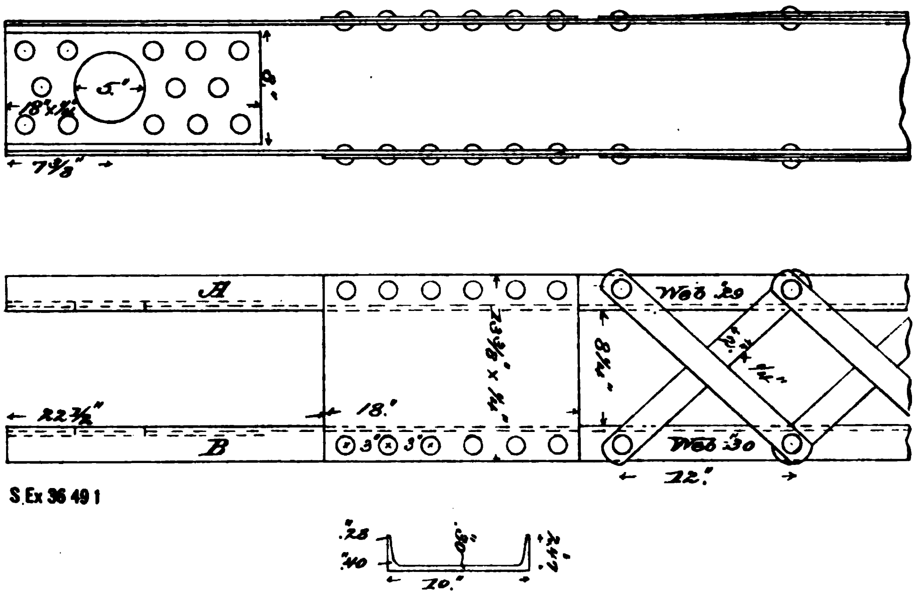
Manufacturers' marks.	Tensile strength.	Mean tensile strength.
	Pounds.	
Manufacturer D—Continued:		
Item No. 5, plain	118	130
Do	127	
Do	145	
Item No. 6, plain	156	152
Do	146	
Do	153	
Manufacturer E:		
65½"	106	103
Do	97	
Do	105	
75½"	86	91
Do	89	
Do	99	
Manufacturer F:		
No. 2, 72" wide; No. 5, 75" wide	181	178
No. 5, 75" wide	182	
Do	170	
Manufacturer G:		
No. 2, W; item No. 1, 2, 3, 4, 5, 6	108	93
Do	77	
No. 3, B; item No. 1, 2, 3, 4, 5, 6	124	113
Do	102	

33.—WROUGHT-IRON LATTICED COLUMNS.

[Pin ends. Tested in horizontal position, with plane of pins vertical. Wrought-iron pin aresting in cast-iron bolsters.]

No. 3909

Wrought Iron Latticed Column.



S.Ex 36 49 1

No. 3909.

Length, center to center of pins, 27′ 0″.
Gauged length (along center line of channel A), 2′ 0″.
Total weight, 1,235 pounds.
Counter-weight at middle, 620 pounds.
Sectional area (channels), 9.30 square inches.

There are four $\frac{13}{16}''$ holes in the web of channel bar B, about 9′ 3″ from center of north pin hole.

At the south end of the column the channel-bar flanges were cut away to $1\frac{1}{4}''$ in width for a distance of 6″ inside the pin holes.

Applied loads.		In gauged length.		Deflections at middle.		Deflection sets.	
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	Horizontal.	Vertical.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
10,000	....	0.	0.	0.	0.	Initial load.	
20,000	....	.0087	0.	0.	0.		
80,000	....	.0180	0.	0.	0.		
40,000	....	.0276	.0003	0.	0.		
50,000	....	.0370	.0008	0.	0.		
60,000	....	.0461	.0000	0.	—.01		
70,000	....	.0555	.0011	0.	—.01		
80,000	....	.0649	.0018	0.	—.01		
90,000	....	.0740	.0016	0.	—.01		
100,000	....	.0833	.0020	0.	—.01		
110,000	....	.0925	.0021	0.	—.01		
120,000	....	.1019	.0021	0.	—.01	*Inch.*	*Inch.*
130,000	....	.1105	.0021	0.	—.01	0.	—.01
140,000	....	.1200	.0021	0.	0.	0.	—.01
150,000	....	.1289	.0021	0.	0.	0.	—.01
160,000	....	.1381	.0021	0.	0.	0.	0.
170,000	....	.1474	.0021	0.	+.01	0.	0.
180,000	....	.1563	.0021	0.	.02	0.	0.
190,000	....	.1659	.0024	0.	.03	0.	0.
200,000	....	.1750	.0026	0.	.03	0.	0.
210,000	....	.1842	.0027	0.	.03	0.	0.
220,000	....	.1940	.0029	0.	.04	0.	0.
230,000	....	.2031	.0033	0.	.04	0.	+.01
240,000	....	.2128	.0039	.03	.05	.01	.02
245,000	....	.2180	....	.03	.06	....	....
250,000	....	.2220	.0047	.03	.06	.01	.03
Scale started in the vicinity of $\frac{13}{16}''$ holes in channel B.							
255,000	....	.2270	....	.03	.06	....	....
260,000	....	.2320	.0059	.03	.07	.01	.03
265,000	....	.2380	....	.03	.07	....	....
270,000	....	.2432	.0080	.03	.08	.01	.04
Scale generally disturbed in front of pins and at intervals along the length of each channel.							
275,000	....	.2490	....	.03	.09	.01	.06
280,000	....	.2551	.0118	.03	.10		
285,000	....	.2615	....	.03	.12		
290,000	....	....	....	.03	.17		
290,300	....	....	....	.03	.19		
295,000	....	....	....	.01	.20		
296,100	31,840	....	....	.01 0.	.26 .50	Ultimate strength.	
290,000	....	....	....	0.	.60	Readings taken after passing the maximum load.	
275,000	....	....	....	0.	.85		

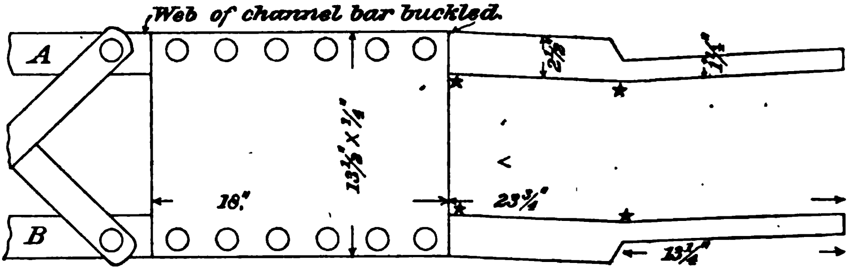
The post failed at the south end. The web of channel bar A buckled in front of the pin, also opposite inside ends of the side plates. Both channels took a sharp bend at the outside ends of the side plates at the same end of the post, also at the ends of the eye plates.

At intervals along the channel-bar webs, lines of scale at right angles to the axis of the post were raised.

Elongation of pin holes, ″.06 each.

At the north end of the post it was necessary to cut off the inside heads of eight rivets (which were not countersunk) in each eye plate, in order to make room for cast-iron bolsters for the pin seat.

It was not apparent that the resistance of the post was weakened by the removal of these rivet heads.

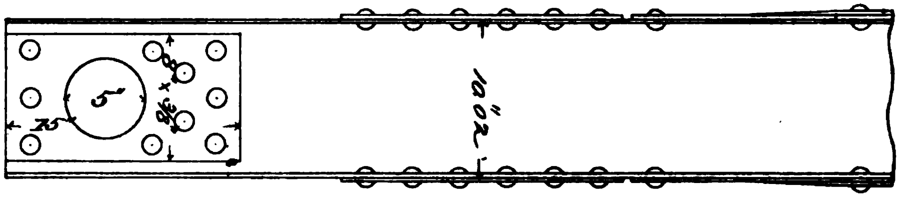


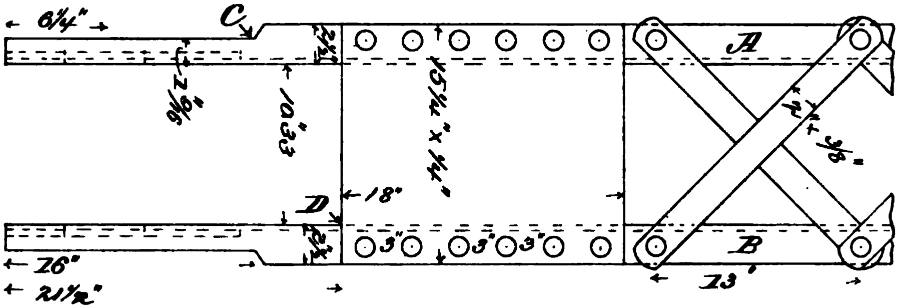
★ *Sharp bends in channel bars.*

No. 3910

Wrought Iron Latticed Column.

North end.



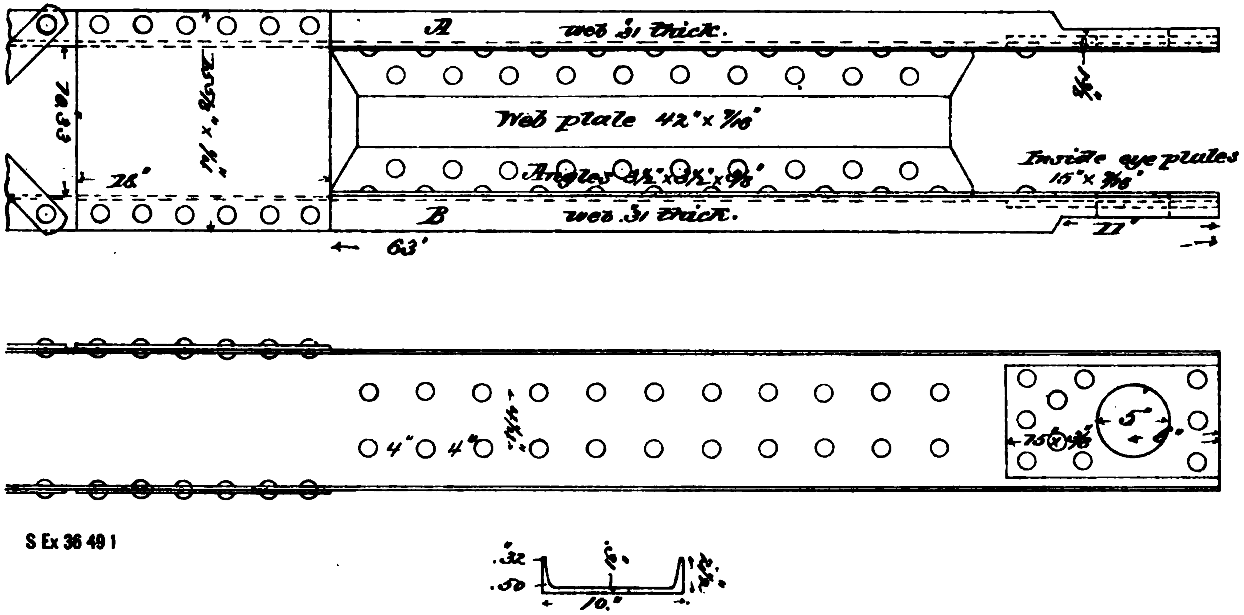


S Ex 36 49 1

No. 3920

Wrought Iron Latticed Column.

South end.



No. 3910.

Length center to center of pin holes, 26′ 0″.
Gauged length (along center line of channel A), 200″.
Total weight, 1,554 pounds.
Counter-weight at middle, 777 pounds.
Sectional area (channels), 9.79 square inches.
The gauged length was taken symmetrical with the sides plates, hence includes only the latticed portion of the column.

Applied loads.		In gauged length.		Deflections at middle.		Deflection sets.	
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	Horizontal.	Vertical.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
10,000	....	0.	0.	0.	0.	Initial load.	
20,000	....	.0053	0.	0.	0.		
30,000	....	.0123	0.	0.	0.	*Inch.*	*Inch.*
40,000	....	.0191	.0002	0.	0.	0.	—.02
50,000	....	.0261	.0003	0.	0.	0.	—.03
60,000	....	.0330	.0007	0.	0.	0.	—.03
70,000	....	.0401	.0007	0.	0.	0.	—.03
80,000	....	.0472	.0008	0.	0.	0.	—.03
90,000	....	.0544	.0008	0.	0.	0.	—.03
100,000	....	.0618	.0008	0.	0.	0.	—.04
110,000	....	.0683	.0010	0.	—.01	0.	—.04
120,000	....	.0760	.0010	—.01	—.01	—.01	—.04
130,000	....	.0838	.0016	—.01	—.02	—.01	—.05
140,000	....	.0913	.0017	—.01	—.03	—.01	—.05
150,000	....	.0990	.0018	—.01	—.03	—.01	—.06
160,000	....	.1060	.0028	—.01	—.04	—.01	—.06
170,000	....	.1140	.0029	—.02	—.05	—.01	—.06
180,000	....	.1215	.0033	—.02	—.06	—.02	—.06
190,000	....	.1300	.0040	—.03	—.07	—.01	—.06
200,000	....	.1385	.0051	—.03	—.07	—.01	—.07
Scale starts off channel B at a distance of 6 to 7 feet from pin at south end.							
210,000	....	.1472	.0064	—.03	—.07	—.01	—.07
220,000	....	.1557	.0075	—.03	—.08	—.01	—.08
230,000	....	.1660	.0102	—.04	—.08	—.01	—.08
Lines of scale generally started off web of channel B, along the entire length latticed. Occasional lines of scale started off the web of channel A.							
240,000	....	.1758	.0125	—.04	—.09	—.01	—.08
250,000	....	.1865	.0154	—.04	—.10	—.02	—.09
260,000	....	.1980	.0198	—.05	—.13	—.02	—.10
267,000	27,270	....	....	—.05	—.60	Ultimate strength.	

Post failed at the north end.

Channel A took a sharp bend at point C, opposite the inside end of the eye-plate, and at the end of the reduced width of flange.

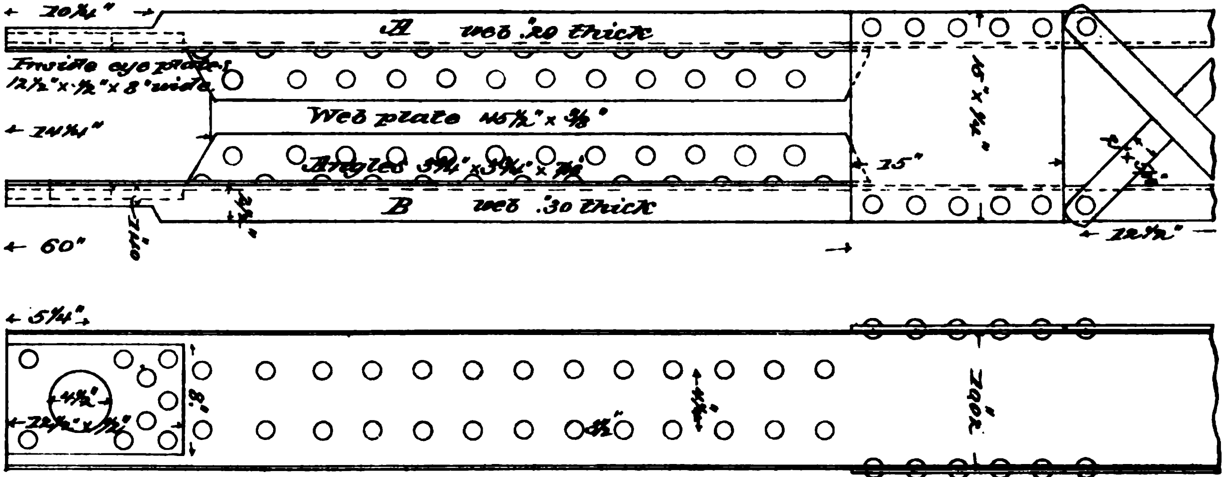
Channel B took a sharp bend at the end of the side plates. The post took a downward direction at this end, parallel to the plane of the pins.

Elongation of pin holes: North end, ″.05 each; south end, .″02.

No. 3911

Wrought Iron Latticed Column.

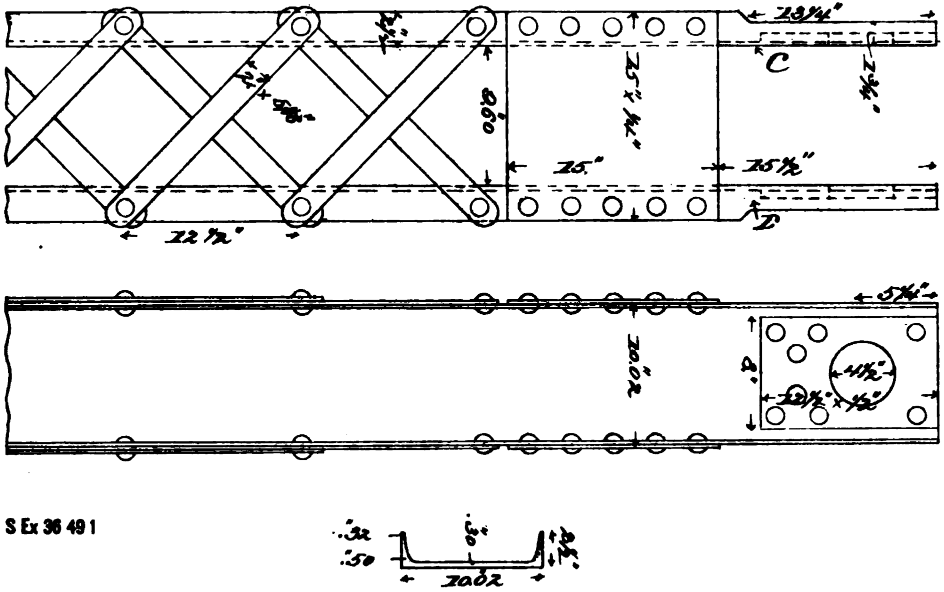
North end.



No. 3911

Wrought Iron Latticed Column.

Southend



S Ex 36 49 1

No. 3911.

Length, center to center of pins, 25′ 6″.

Gauged length (along center line of channel A symmetrical with the latticed portion), 200″.

Total weight, 1,469 pounds.

Counter-weight at middle, 735 pounds.

Sectional area (channels), 9.62 square inches.

Applied loads.		In gauged length.		Deflections at middle.		Deflection sets.	
Total.	Per square inch.	Compression.	Set.	Horizontal.	Vertical.	Horizontal.	Vertical.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
10,000	....	0.	0.	0.	0.	Initial load.	
20,000	....	.0063	0.	0.	0.	*Inch.*	*Inch.*
30,000	....	.0138	0.	0.	0.	0.	0.
40,000	....	.0206	0.	0.	.01	0.	0.
50,000	....	.0280	.0002	.01	.02	0.	0.
60,000	....	.0350	.0002	.01	.02	0.	0.
70,000	....	.0425	.0002	.01	.02	0.	0.
80,000	....	.0487	—.0004	.02	.04	0.	0.
90,000	....	.0564	—.0004	.02	.04	.01	.01
100,000	....	.0635	—.0004	.02	.04	.02	.00
110,000	....	.0710	—.0004	.02	.04	.02	.00
120,000	....	.0782	—.0002	.02	.04	.02	.00
130,000	....	.0860	0.	.03	.04	.02	.00
140,000	....	.0032	.0002	.03	.04	.02	0.
150,000	....	.1008	.0003	.03	.04	.02	0.
160,000	....	.1085	.0005	.04	.04	.03	0.
170,000	....	.1160	.0009	.04	.04	.01	0.
180,000	....	.1240	.0011	.04	.03	.02	0.
190,000	....	.1318	.0015	.03	.03	.02	0.
200,000	....	.1398	.0018	.03	.02	.02	0.
210,000	....	.1476	.0024	.04	.02	.02	0.
220,000	....	.1555	.0030	.04	.02	.02	0.
230,000	....	.1640	.0039	.03	.01	.02	—.01
240,000	....	.1725	.0051	.04	.00	.02	—.01
250,000	....	.1815	.0065	.05	0.	.01	—.02
260,000*	....	.1913	.0090	.05	0.	.02	—.03
270,000	....	.2020	.0125	.06	—.03	.02	—.03
280,000	....	.2130	.0168	.07	—.03	.02	—.03
290,000	....	.2270	.0225	.10	—.05	.03	—.05
300,000	31,185	....	....	.12	—.08	Ultimate strength.	

* Snapping sounds.

Post failed near the south end.

Both channels took sharp bends at C and D, at ends of eye-plates, opposite the end of reduced width of flanges, and at the outside ends of the side plates.

Lines of scale were started off channel bar A at frequent intervals, to a less extent on channel bar B.

Elongation of pin holes: North end, ″.01 each; south end, ″.04 each.

No. 3912.

Length center to center of pin holes, 24′ 0″.

Gauged length (along center line of channel A symmetrical with latticed section), 200″.

Total weight, 1,105 pounds.

Counter-weight at middle, 550 pounds.

Sectional area (channels), 9.45 square inches.

Applied loads.		In gauged length.		Deflections at middle.		Deflection sets.	
Total.	Per inch.	Compression.	Set.	Horizontal.	Vertical.	Horizontal.	Vertical.
Pounds.	*Pounds.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*		
10,000	....	0.	0.	0.	0.	Initial load.	
20,000	....	.0054	0.	0.	0.	....	....
30,000	....	.0120	0.	0.	0.	*Inch.*	*Inch.*
40,000	....	.0190	—.0004	—.01	.01	0.	0.
50,000	....	.0257	—.0007	—.01	.01	0.	0.
60,000	....	.0328	—.0010	—.01	.02	—.01	—.02
70,000	....	.0400	—.0010	—.01	.02	—.02	—.02
80,000	....	.0470	—.0010	—.02	.02	—.02	—.02
90,000	....	.0540	—.0010	—.02	.02	—.02	—.02
100,000	....	.0615	—.0010	—.02	.02	—.02	—.02
110,000	....	.0689	—.0010	—.02	.02	—.02	—.02
120,000	....	.0758	—.0010	—.02	.02	—.02	—.02
130,000	....	.0830	—.0010	—.02	.02	—.02	—.02
140,000	....	.0905	—.0011	—.02	.02	—.02	—.03
150,000	....	.0980	—.0012	—.03	.02	—.02	—.03
160,000	....	.1050	—.0012	—.04	.01	—.02	—.03
170,000	....	.1125	—.0012	—.05	.01	—.02	—.04
180,000	....	.1205	—.0010	—.05	.01	—.03	—.04
190,000	....	.1280	—.0007	—.06	0.	—.02	—.04
200,000	....	.1358	—.0003	—.06	0.	—.03	—.06
210,000	....	.1435	0.	—.07	0.	—.04	—.04
220,000	....	.1515	.0008	—.07	0.	—.04	—.03
230,000	....	.1590	.0012	—.06	0.	0.	—.04
240,000	....	.1680	—.0010	—.06	.01	—.01	—.04
250,000	....	.1732	.0005	—.07	.03	0.	—.04
260,000	....	.1820	.0020	—.08	.03	—.03	—.03
270,000	....	.1920	.0045	—.10	.05	—.02	0.
280,000	....	....	....	—.12	.10	....	....
290,000	....	....	....	—.20	.16	....	....
300,000	....	....	....	—.28	.28	....	....
305,000	....	....	....	—.35	.48	....	....
306,500	32,430	....	....	—.38	.60	Ultimate strength.	

Post failed near the north end.

Both channels took sharp bends at C and D, at ends of eye-plates, and between the reduced widths of flanges of channels and side plates.

Lines of scale started off each channel.

Elongation of pin holes: North end, ″.10 and ″.15; south end, ″.05 each.

34.—COMPRESSION OF COMMON, HARD-BURNT, AND FACE BRICKS.

These tests are preliminary to the test of a series of brick piers which have been constructed, and are seasoning, awaiting the time of testing.

Single bricks are tested with their bed surfaces carefully ground flat and set in a thin facing of plaster of Paris to insure even bearings against the compression platforms of the testing-machine.

Different bricks tested in this manner, while giving comparable results, exhibit greater compressive resistance, owing to their contact with the rigid metal platforms of the testing-machine than properly belongs to them, and greater strength than when placed between cushions of their own kind, as shown by the reduction in strength of the sets of three bricks tested together.

The strength realized in a pier is more correctly represented by the latter test than the former.

It is purposed taking micrometer measurements of the compression of the piers when they are tested in the same manner, as done in earlier tests, and also determine the compression of mortar prisms of the same quality as used in their construction.

The present series furnish data relating to the compression of the bricks themselves.

In order to obtain greater length in which to measure the compressions the bricks were loaded endwise and measurements taken between two small drilled holes 6″ apart on one face of the brick in which the points of the micrometer were held.

The modulus of elasticity is computed for the bricks so tested, using the compressions between such loads as appeared from their uniformity to be most reliable.

A number of common bricks were selected which should represent soft under-burnt bricks, medium hard, and some of a dark red color, which were very hard burnt.

The results show a striking difference in their moduli of elasticity—the softest bricks having a modulus less than one-half that of the harder ones.

The face bricks showed considerable variation, although they differed little in color. Considering the modulus of elasticity is nearly uniform in bricks up to their crushing loads, and differs greatly from the moduli of weaker class of mortars, it appears that fissures may be caused under certain loads from yielding within the brick work, even if the foundations on which the work rests do not contribute to that result.

No. 451.

Common Brick.

Sectional area, 3''.35 × 2''.18 = 7.3 square inches.
Length, 7.60.
Gauged length, 6''.
This brick was medium hard burnt; dark red color.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
730	100	0.	0.	Initial load.
1,460	200	0.		
2,190	300	.0001		
2,920	400	.0001		
3,650	500	.0002		
4,380	600	.0003		
5,840	800	.0004		
7,300	1,000	.0006	0.	
8,760	1,200	.0009		
10,220	1,400	.0013		
11,680	1,600	.0017		
13,140	1,800	.0019		
14,600	2,000	.0023	0.	
16,060	2,200	.0027		
17,520	2,400	.0029		
18,980	2,600	.0034		
20,440	2,800	.0037		
21,900	3,000	.0041	0.	
23,360	3,200	.0045		
24,820	3,400	.0048		
26,280	3,600	.0051		
27,740	3,800	.0054		
29,200	4,000	.0056	0.	
30,660	4,200	.0059		
32,120	4,400	.0064		
33,580	4,600	.0070		
35,040	4,800	.0073		
36,500	5,000	.0076	.0001	
37,960	5,200	.0079		
39,420	5,400	.0082		
40,880	5,600	.0085		
42,340	5,800	.0090		
43,800	6,000	.0093	.0002	
45,260	6,200	.0096		
46,720	6,400	.0099		
48,180	6,600	.0102		
49,640	6,800	.0105		
51,100	7,000	.0111	.0008	
52,560	7,200	.0113		
54,020	7,400	.0118		
55,480	7,600	.0121		
56,940	7,800	.0123		
58,400	8,000	.0127	.0003	
59,860	8,200	.0130		
61,320	8,400	.0134		Small piece flew out of middle of one face.
62,780	8,600	.0137		
64,240	8,800	.0140		
65,700	9,000	.0143	.0004	
67,160	9,200	.0146		
68,620	9,400	.0149		
70,080	9,600	.0153		
71,540	9,800	.0156		
73,000	10,000	.0159	.0004	E = 3,750,000; between 5,000 and 10,000 pounds per square inch.
17,520	2,400			Rested under this load 15 hours.
74,460	10,200	.0163		
75,920	10,400	.0167		
77,380	10,600	.0169		
78,840	10,800	.0173		
80,300	11,000	.0176	.0004	
81,760	11,200	.0178		
83,220	11,400	.0181		

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
84,680	11,600	.0184	....	
86,140	11,800	.0187	....	
87,600	12,000	.0190	.0005	
89,060	12,200	.0192	....	
90,520	12,400	.0196	....	
91,980	12,600	.0199	....	Continued snapping.
93,440	12,800	.0202	....	
94,900	13,000	.0206	.0005	
96,360	13,200	.0209	....	
97,820	13,400	.0213	....	
99,280	13,600	.0216	....	Fragments flew off one side.
103,400	14,160	....	....	Crushing strength.

Fragments split off sides, showing a tendency towards pyramidal fracture.

No. 452.

Common Brick.

Sectional area, 3″.40 × 2″.28 = 7.75 square inches.
Length, 7″.80.
Gauged length, 6″.00.

This brick was selected from the lot of hard-burnt bricks to be tested on account of its light red color and softer appearance than the preceding.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
775	100	0.	0.	Initial load.
1,550	200	.0002	....	
3,100	400	.0004	....	
4,650	600	.0006	....	
6,200	800	.0010	....	
7,750	1,000	.0013	.0001	
9,300	1,200	.0016	....	
10,850	1,400	.0022	....	
12,400	1,600	.0026	....	
13,950	1,800	.0032	....	
15,500	2,000	.0036	.0001	
17,050	2,200	.0041	....	
18,600	2,400	.0047	....	
20,150	2,600	.0052	....	
21,700	2,800	.0057	....	
23,250	3,000	.0062	.0001	
24,800	3,200	.0067	....	
26,350	3,400	.0071	....	
27,900	3,600	.0077	....	
29,450	3,800	.0081	....	
31,000	4,000	.0087	.0001	
32,550	4,200	.0092	....	
34,100	4,400	.0097	....	
35,650	4,600	.0102	....	
37,200	4,800	.0107	....	
38,750	5,000	.0113	.0001	
40,300	5,200	.0118	....	
41,850	5,400	.0124	....	
43,400	5,600	.0130	....	
44,950	5,800	.0136	....	
46,500	6,000	.0142	.0003	
48,050	6,200	.0147	....	
49,600	6,400	.0152	....	
51,150	6,600	.0157	....	Snapping sound.
52,700	6,800	.0162	....	
54,250	7,000	.0167	.0005	E=2,360,000; between 2,000 and 7,000 pounds per square inch.
55,800	7,200	.0173	....	
57,350	7,400	.0178	....	
58,900	7,600	.0183	....	
60,450	7,800	.0188	....	
62,000	8,000	.0202	.0007	Pieces flake off two corners.
69,500	8,970	....	....	Crushing strength.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
84, 680	11, 600	.0184	....	
86, 140	11, 800	.0187	....	
87, 600	12, 000	.0190	.0005	
89, 060	12, 200	.0192	....	
90, 520	12, 400	.0196	....	
91, 980	12, 600	.0199	....	Continued snapping.
93, 440	12, 800	.0202	....	
94, 900	13, 000	.0206	.0005	
96, 860	13, 200	.0209	....	
97, 820	13, 400	.0213	....	
99, 280	13, 600	.0216	....	Fragments flew off one side.
103, 400	14, 160	....	....	Crushing strength.

Fragments split off sides, showing a tendency towards pyramidal fracture.

No. 461.

Face Brick.

Sectional area, 3″.50 × 2″.14 = 7.49 square inches.
Length, 7″.70.
Gauged length, 6″.00.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
749	100	0.	0.	Initial load.
1,498	200	.0002	....	
2,996	400	.0009	....	
4,494	600	.0016	....	
5,992	800	.0023	....	
7,490	1,000	.0028	.0004	
8,988	1,200	.0033	....	
10,486	1,400	.0037	....	
11,9-4	1,600	.0043	....	
13,482	1,800	.0046	....	
14,980	2,000	.0052	.0006	
16,478	2,200	.0054	....	
17,976	2,400	.0059	....	
19,474	2,600	.0064	....	
20,972	2,800	.0069	....	
22,470	3,000	.0072	.0007	
23,968	3,200	.0075	....	
25,466	3,400	.0079	....	
26,964	3,600	.0083	....	
28,462	3,800	.0087	....	
29,960	4,000	.0092	.0007	
31,458	4,200	.0097	....	
32,956	4,400	.0103	....	
34,454	4,600	.0104	....	
35,952	4,800	.0109	....	
37,450	5,000	.0113	.0007	
38,948	5,200	.0118	....	
40,446	5,400	.0122	....	
41,944	5,600	.0126	....	
43,412	5,800	.0128	....	
44,940	6,000	.0132	.0010	
46,438	6,200	.0136	....	
47,936	6,400	.0140	....	
49,434	6,600	.0143	....	
50,932	6,800	.0147	....	
52,430	7,000	.0153	.0012	E=3,080,000; between 1,000 and 7,000 pounds per square inch.
53,928	7,200	.0155	....	Snapping sounds.
55,426	7,400	.0159	....	
56,924	7,600	.0164	....	
58,422	7,800	.0166	....	Crushing strength.
59,700	7,970	....	....	

Pyramidal fracture.

Fragments were detached very evenly from the four faces. The outside of the brick was dark red color, the interior portions lighter red.

No. 460.

Face Brick.

Sectional area, 3″.52 × 2″.16 = 7.6 square inches.
Length, 7″.70.
Gauged length, 6″.00.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
760	100	0.	0.	Initial load.
1,520	200	.0000	....	
3,040	400	.0000	....	
4,560	600	.0000	....	
6,080	800	.0002	....	
7,600	1,000	.0004	0.	
9,120	1,200	.0006	....	
10,640	1,400	.0008	....	
12,160	1,600	.0010	....	
13,680	1,800	.0012	....	
15,200	2,000	.0014	0.	
16,720	2,200	.0018	....	
18,240	2,400	.0020	....	
19,760	2,600	.0022	....	
21,280	2,800	.0024	....	
22,800	3,000	.0028	0.	
24,320	3,200	.0032	....	
25,840	3,400	.0034	....	
27,360	3,600	.0038	....	
28,880	3,800	.0040	....	
30,400	4,000	.0044	0.	
31,920	4,200	.0046	....	
33,440	4,400	.0050	....	
34,960	4,600	.0053	....	
36,480	4,800	.0056	....	
38,000	5,000	.0058	0.	
39,520	5,200	.0062	....	
41,040	5,400	.0063	....	
42,560	5,600	.0067	....	
44,080	5,800	.0071	....	
45,600	6,000	.0073	0.	E = 4,070,000; between 2,000 and 6,000 pounds per square inch.
47,120	6,200	.0077	....	
48,640	6,400	.0082	....	
50,160	6,600	.0083	....	
51,680	6,800	.0087	....	Snapping sound.
53,200	7,000	.0093	0.	
54,720	7,200	.0094	....	
56,240	7,400	.0099	....	
57,760	7,600	....	....	Began to crack and continued to the close of the test.
61,800	8,130	....	....	Crushing strength.

Pyramidal fragments.

There was a decided contrast in color between the outside of this brick, which was dark red, and the interior, which was lighter color.

No. 466.

Face Brick.

Sectional area, 3″.58 × 2″.21 = 7.91 square inches.
Length, 7″.68.
Gauged length, 6″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
791	100	0.	0.	Initial load.
1,582	200	.0001	....	
3,164	400	.0002	....	
4,746	600	.0003	....	
6,328	800	.0004	....	
7,910	1,000	.0006	−.0001	
7,910	1,000	.0006	....	After determining the set.
9,492	1,200	.0008	....	
11,074	1,400	.0011	....	
12,656	1,600	.0014	....	
14,238	1,800	.0017	....	
15,820	2,000	.0020	.0001	
15,820	2,000	.0020	....	After determining the set.
17,402	2,200	.0024	....	
18,984	2,400	.0026	....	
20,566	2,600	.0030	....	
22,148	2,800	.0032	....	
23,730	3,000	.0036	.0002	
23,730	3,000	.0036	....	After determining the set.
25,312	3,200	.0039	....	
26,894	3,400	.0042	....	
28,476	3,600	.0046	....	
30,058	3,800	.0049	....	
31,640	4,000	.0053	.0003	
31,640	4,000	.0053	....	After determining the set.
33,222	4,200	.0057	....	
34,804	4,400	.0061	....	E = 3,750,000; between 3,000 and 6,000 pounds.
36,386	4,600	.0064	....	
37,968	4,800	.0067	....	
39,550	5,000	.0071	.0003	
39,550	5,000	.0070	....	After determining the set.
41,132	5,200	.0075	....	
42,714	5,400	.0079	....	
44,296	5,600	.0084	....	
45,878	5,800	.0087	....	
47,460	6,000	.0089	.0004	
47,460	6,000	.0091	....	After determining the set.
49,042	6,200	.0095	....	
50,624	6,400	.0098	....	Cracked.
52,206	6,600	.0104	....	
56,500	7,140	....	....	Crushing strength.

No. 467.

Face Brick.

Sectional area, 3″.58 × 2″.10 = 7.52 square inches.
Length, 7″.70.
Gauged length, 6.00 square inches.

Applied loads.		In gauged strength.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
752	100	0.	0.	Initial load.
1,504	200	.0001	....	
3,008	400	.0004	....	
4,512	600	.0007	....	
6,016	800	.0010	....	
7,520	1,000	.0013	0.	
7,520	1,000	.0013	....	After determining the set.
9,024	1,200	.0017	....	
10,528	1,400	.0021	....	
12,032	1,600	.0022	....	
13,536	1,800	.0025	....	
15,040	2,000	.0028	.0001	
15,040	2,000	.0028	....	After determining the set.
16,544	2,200	.0031	....	
18,048	2,400	.0036	....	
19,552	2,600	.0038	....	
21,056	2,800	.0041	....	
22,560	3,000	.0045	.0002	
22,560	3,000	.0046	....	After determining the set.
24,064	3,200	.0050	....	
25,568	3,400	.0052	....	E=3,300,000; between 3,000 and 4,000 pounds.
27,072	3,600	.0056	....	
28,576	3,800	.0060	....	
30,080	4,000	.0064	.0002	
30,080	4,000	.0064	....	After determining the set.
31,584	4,200	.0068	....	
33,088	4,400	.0072	....	
34,592	4,600	.0076	....	
36,096	4,800	.0077	....	Cracked.
42,900	5,700	....	....	Crushing strength.

No. 468.

Face Brick.

Sectional area, 3″.62 × 2″.16 = 7.82 square inches.
Length, 7″.70.
Gauged length, 6″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
782	100	0.	0.	Initial load.
1,564	200	.0000	....	
3,128	400	.0002	....	
4,692	600	.0006	....	
6,256	800	.0009	....	
7,820	1,000	.0012	0.	
9,384	1,200	.0018	....	
10,948	1,400	.0021	....	
12,512	1,600	.0023	....	
14,076	1,800	.0029	....	
15,640	2,000	.0033	0.	
17,204	2,200	.0038	....	
18,768	2,400	.0042	....	
20,332	2,600	.0047	....	
21,896	2,800	.0052	....	
23,460	3,000	.0056	.0001	
25,024	3,200	.0061	....	
26,588	3,400	.0066	....	
28,152	3,600	.0070	....	
29,716	3,800	.0074	....	
31,280	4,000	.0079	.0001	
32,844	4,200	.0084	....	
34,408	4,400	.0089	....	E = 2,500,000; between 4,000 and 5,000 pounds.
35,972	4,600	.0094	....	
37,536	4,800	.0099	....	
39,100	5,000	.0104	.0002	
40,664	5,200	.0109	....	
42,228	5,400	.0115	....	
43,792	5,600	.0122	....	
45,356	5,800	.0128	....	Snapping sounds.
46,920	6,000	....	....	Crushing strength.

No. 469.

Common Brick (light red color).

Sectional area, 3″.36×2″.26 = 7.59 square inches.
Length, 7″.70.
Gauged length, 6″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
759	100	0.	0.	Initial load.
1,518	200	.0001	....	
3,036	400	.0007	....	
4,554	600	.0010	....	
6,072	800	.0016	....	
7,590	1,000	.0022	0.	
9,108	1,200	.0026	....	
10,626	1,400	.0032	....	
12,144	1,600	.0036	....	
13,662	1,800	.0041	....	
15,180	2,000	.0045	0.	
16,698	2,200	.0051	....	
18,216	2,400	.0056	....	
19,734	2,600	.0061	....	
21,252	2,800	.0068	....	
22,770	3,000	.0071	.0001	
24,288	3,200	.0078	....	
25,806	3,400	.0085	....	
27,324	3,600	.0091	....	
28,842	3,800	.0096	....	
30,360	4,000	.0102	.0001	
31,878	4,200	.0108	....	
33,396	4,400	.0112	....	
34,914	4,600	.0119	....	
36,432	4,800	.0122	....	
37,950	5,000	.0128	.0003	
39,468	5,200	.0137	....	E = 2,200,000; between 5,000 and 7,000 pounds.
40,986	5,400	.0141	....	
42,504	5,600	.0147	....	
44,022	5,800	.0152	....	
45,540	6,000	.0157	.0004	Snapping sounds.
47,058	6,200	.0162	....	
48,576	6,400	.0168	....	
50,094	6,600	.0175	....	
51,612	6,800	.0182	....	Snapping sounds repeated.
53,130	7,000	.0188	.0006	
54,648	7,200	.0196	....	
56,166	7,400	.0202	....	
57,684	7,600	.0209	....	
58,100	7,650	....	....	Crushing strength.

No. 470.

Common Brick (light red color).

Sectional area, 3″.46×2″.27=7.85 square inches.
Length, 7″.90.
Gauged length, 6″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
785	100	0.	0.	Initial load.
1,570	200	.0002	....	
3,140	400	.0008	....	
4,710	600	.0013	....	
6,280	800	.0020	....	
7,850	1,000	.0025	0.	
9,420	1,200	.0032	....	
10,990	1,400	.0038	....	
12,560	1,600	.0045	....	
14,130	1,800	.0052	....	
15,700	2,000	.0059	.0002	
17,270	2,200	.0064	....	
18,840	2,400	.0072	....	
20,410	2,600	.0079	....	
21,980	2,800	.0086	....	
23,550	3,000	.0093	.0002	
25,120	3,200	.0101	....	
26,690	3,400	.0110	....	
28,260	3,600	.0117	....	
29,830	3,800	.0124	....	
31,400	4,000	.0131	.0006	
32,970	4,200	.0140	....	E=1,700,000; between 3,000 and 6,000 pounds.
34,540	4,400	.0148	....	
36,110	4,600	.0155	....	
37,680	4,800	.0163	....	
39,250	5,000	.0170	.0010	
40,820	5,200	.0178	....	
42,390	5,400	.0185	....	
43,960	5,600	.0191	....	
45,530	5,800	.0199	....	
47,100	6,000	.0207	.0011	
48,670	6,200	.0215	....	
50,240	6,400	.0222	....	
51,810	6,600	.0229	....	
53,380	6,800	.0236	....	
54,950	7,000	.0243	.0016	Small piece flew off.
56,400	7,180	....	....	Crushing strength.

No. 471.

Common Brick (light red color).

Sectional area, 3″.37 × 2″.27 = 7.65 square inches.
Length, 7″.68.
Gauged length, 6″.
Brick concave on one bed face, ″.08; opposite face convex.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
765	100	0.	0.	Initial load.
1,530	200	.0001	....	
3,060	400	.0007	....	
4,590	600	.0010	....	
6,120	800	.0013	....	
7,650	1,000	.0017	0.	
9,180	1,200	.0021	....	
10,710	1,400	.0025	....	
12,240	1,600	.0029	....	
13,770	1,800	.0034	....	
15,300	2,000	.0039	.0001	
16,830	2,200	.0043	....	
18,360	2,400	.0048	....	
19,890	2,600	.0051	....	
21,420	2,800	.0057	....	
22,950	3,000	.0061	.0005	
24,480	3,200	.0066	....	
26,010	3,400	.0071	....	
27,540	3,600	.0075	....	
29,070	3,800	.0079	....	
30,600	4,000	.0084	.0006	
32,130	4,200	.0088	....	
33,660	4,400	.0093	....	
35,190	4,600	.0099	....	
36,720	4,800	.0104	....	E = 2,700,000; between 4,000 and 7,000 pounds.
38,250	5,000	.0108	.0008	
39,780	5,200	.0111	....	
41,310	5,400	.0118	....	
42,840	5,600	.0121	....	
44,370	5,800	.0127	....	
45,900	6,000	.0132	.0009	
47,430	6,200	.0137	....	
48,960	6,400	.0141	....	
50,490	6,600	.0147	....	
52,020	6,800	.0151	....	
53,550	7,000	.0156	.0010	
55,080	7,200	.0160	....	Snapping sounds.
60,800	7,880	....	....	Crushing strength.

No. 472.

Common Brick (medium red color).

Sectional area, 3″.33 × 2″.24 = 7.46 square inches.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
746	100	0.	0.	Initial load.
1, 492	200	.0001	....	
2, 984	400	.0002	....	
4, 476	600	.0003	....	
6, 968	800	.0004	....	
7, 460	1, 000	.0007	0.	
8, 952	1, 200	.0010	....	
10, 444	1, 400	.0013	....	
11, 936	1, 600	.0018	....	
13, 428	1, 800	.0021	....	
14, 920	2, 000	.0023	0.	
16, 412	2, 200	.0028	....	
17, 904	2, 400	.0031	....	
19, 396	2, 600	.0036	....	
20, 888	2, 800	.0039	....	
22, 380	3, 000	.0042	0.	
23, 872	3. 200	.0047	....	
25, 364	3, 400	.0052	....	
26, 856	3, 600	.0055	....	
28, 348	3, 800	.0060	....	
29, 840	4, 000	.0064	0.	
31, 332	4, 200	.0069	....	
32, 824	4, 400	.0073	....	
34, 316	4, 600	.0078	....	
35, 808	4, 800	.0081	....	E=2,700,000; between 6,000 and 8,000 pounds.
37, 300	5, 000	.0086	.0001	
38, 792	5, 200	.0091	....	
40, 284	5, 400	.0096	....	
41, 776	5, 600	.0100	....	
43, 268	5, 800	.0104	....	
44, 760	6, 000	.0109	.0001	
46, 252	6, 200	.0111	....	
47, 744	6, 400	.0118	....	
49, 236	6, 600	.0121	....	
50, 728	6, 800	.0126	....	
52, 220	7, 000	.0131	.0001	
53, 712	7, 200	.0136	....	
55, 204	7, 400	.0141	....	
56, 696	7, 600	.0143	....	
58, 188	7, 800	.0148	....	
59, 680	8, 000	.0154	.0002	
61, 172	8, 200	.0157	....	
62, 664	8, 400	.0161	....	Snapping sounds.
64, 156	8, 600	.0165	....	
65, 648	8, 800	.0170	....	
67, 140	9, 000	.0174	.0002	
68, 632	9, 200	.0179	....	Piece flew off.
78, 200	10, 480	....	....	Crushing strength.

No. 475.

Common Brick (dark red color).

Sectional area, 3''.23 × 2''.20 = 7.75 square inches.
Length, 7''.50.
Gauged length, 6''.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
775	100	0.	0.	Initial load.
1,550	200	.0003	....	
3,100	400	.0006	....	
4,650	600	.0009	....	
6,200	800	.0011	....	
7,750	1,000	.0015	0.	
9,300	1,200	.0017	....	
10,850	1,400	.0020	....	
12,400	1,600	.0025	....	
13,950	1,800	.0028	....	
15,500	2,000	.0033	.0002	
17,050	2,200	.0036	....	
18,600	2,400	.0040	....	
20,150	2,600	.0045	....	
21,700	2,800	.0048	....	
23,250	3,000	.0054	.0003	
24,800	3,200	.0056	....	
26,350	3,400	.0059	....	
27,900	3,600	.0064	....	
29,450	3,800	.0068	....	
31,000	4,000	.0072	.0003	
32,550	4,200	.0076	....	
34,100	4,400	.0078	....	
35,650	4,600	.0084	....	
37,200	4,800	.0088	....	
38,750	5,000	.0090	.0004	
40,300	5,200	.0093	....	
41,850	5,400	.0097	....	
43,400	5,600	.0103	....	
44,950	5,800	.0105	....	
46,500	6,000	.0108	.0004	
48,050	6,200	.0113	....	
49,600	6,400	.0115	....	
51,150	6,600	.0118	....	
52,700	6,800	.0123	....	
54,250	7,000	.0126	.0004	
55,800	7,200	.0129	....	
57,350	7,400	.0134	....	E = 3,750,000; between 7,000 and 10,000 pounds.
58,900	7,600	.0136	....	
60,450	7,800	.0138	....	
62,000	8,000	.0142	.0004	
63,550	8,200	.0148	....	
65,100	8,400	.0150	....	
66,050	8,600	.0153	....	
68,200	8,800	.0156	....	
69,750	9,000	.0159	.0006	
71,300	9,200	.0163	....	
72,850	9,400	.0165	....	
74,400	9,600	.0168	....	
75,950	9,800	.0172	....	
77,500	10,000	.0175	.0006	
79,050	10,200	.0178	....	
80,600	10,400	.0183	....	
82,150	10,600	....	....	Piece flew off side of brick.
101,700	13,120	....	....	Crushing strength.

No. 476.

(*Common Brick (dark red color)*)

Sectional area, 3″.18 × 2″.18 = 6.93 square inches.
Length, 7″.48.
Gauged length, 6″.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
693	100	0.	0.	Initial load.
1,386	200	.0003	....	
2,772	400	.0006	....	
4,158	600	.0008	....	
5,544	800	.0010	....	
6,930	1,000	.0012	0.	
8,316	1,200	.0015	....	
9,702	1,400	.0017	....	
11,088	1,600	.0020	....	
12,474	1,800	.0021	....	
13,860	2,000	.0023	.0001	
15,246	2,200	.0025	....	
16,632	2,400	.0027	....	
18,018	2,600	.0029	....	
19,404	2,800	.0031	....	
20,790	3,000	.0034	.0001	
22,176	3,200	.0035	....	
23,562	3,400	.0038	....	
24,948	3,600	.0040	....	
26,334	3,800	.0042	....	
27,720	4,000	.0045	.0001	
29,106	4,200	.0048	....	
30,492	4,400	.0050	....	
31,878	4,600	.0051	....	
33,264	4,800	.0055	....	
34,650	5,000	.0058	.0002	
36,036	5,200	.0060	....	
37,422	5,400	.0062	....	E=5,000,000; between 5,000 and 8,000 pounds.
38,808	5,600	.0065	....	
40,194	5,800	.0068	....	
41,580	6,000	.0070	.0002	
42,966	6,200	.0072	....	
44,352	6,400	.0073	....	
45,738	6,600	.0075	....	
47,124	6,800	.0078	....	
48,510	7,000	.0080	.0002	
49,896	7,200	.0082	....	
51,282	7,400	.0084	....	
52,668	7,600	.0086	....	
54,054	7,800	.0090	....	
55,440	8,000	.0092	.0003	
56,826	8,200	.0095	....	
58,212	8,400	.0097	....	
59,598	8,600	.0099	....	
60,984	8,800	.0100	....	
62,370	9,000	.0103	.0003	Snapping sounds.
63,756	9,200	....	....	Piece flew off.
91,900	13,260	....	....	Crushing strength.

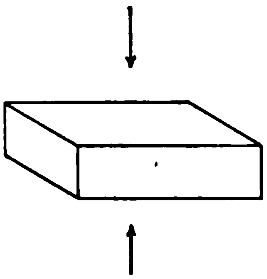
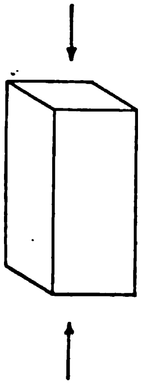
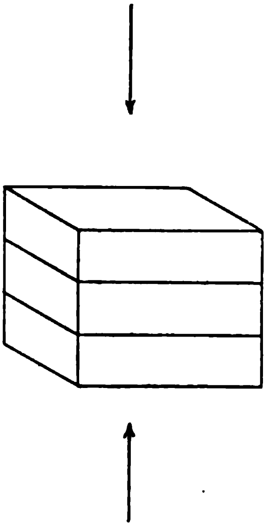
No. 477.

Common Brick (dark red color).

Sectional area, 3″.20 × 2″.18 = 6.98 square inches.
Length, 7″.53.
Gauged length, 6″.00.

Applied loads.		In gauged length.		Remarks.
Total.	Per square inch.	Compression.	Set.	
Pounds.	*Pounds.*	*Inch.*	*Inch.*	
698	100	0.	0.	Initial load.
1,396	200	.0003	....	
2,792	400	.0006	....	
4,188	600	.0009	....	
5,584	800	.0011	....	
6,980	1,000	.0015	0.	
8,376	1,200	.0017	....	
9,772	1,400	.0021	....	
11,168	1,600	.0023	....	
12,564	1,800	.0026	....	
13,960	2,000	.0028	.0002	
15,356	2,200	.0031	....	
16,752	2,400	.0033	....	
18,148	2,600	.0037	....	
19,544	2,800	.0040	....	
20,940	3,000	.0042	.0002	
22,336	3,200	.0044	....	
23,732	3,400	.0048	....	
25,128	3,600	.0051	....	
26,524	3,800	.0053	....	
27,920	4,000	.0057	.0003	
29,316	4,200	.0060	....	
30,712	4,400	.0063	....	
32,108	4,600	.0066	....	
33,504	4,800	.0069	....	
34,900	5,000	.0071	.0005	
36,296	5,200	.0074	....	
37,692	5,400	.0077	....	
39,088	5,600	.0079	....	
40,484	5,800	.0082	....	
41,880	6,000	.0084	.0007	
43,276	6,200	.0087	....	
44,672	6,400	.0091	....	
46,068	6,600	.0093	....	
47,464	6,800	.0097	....	
48,860	7,000	.0099	.0008	
50,256	7,200	.0102	....	
51,652	7,400	.0106	....	
53,048	7,600	.0109	....	
54,444	7,800	.0111	....	
55,840	8,000	.0113	.0009	
57,236	8,200	.0117	....	
58,632	8,400	.0119	....	E = 4,600,000; between 8,000 and 12,000 pounds.
60,028	8,600	.0121	....	
61,424	8,800	.0125	....	
62,820	9,000	.0128	.0009	
64,216	9,200	.0130	....	
65,612	9,400	.0133	....	
67,008	9,600	.0136	....	
68,404	9,800	.0139	....	
69,800	10,000	.0141	.0009	
71,196	10,200	.0144	....	
72,592	10,400	.0146	....	
73,988	10,600	.0149	....	
75,384	10,800	.0151	....	
76,780	11,000	.0154	.0009	
78,176	11,200	.0157	....	
79,572	11,400	.0158	....	
80,968	11,600	.0160	....	
82,364	11,800	.0164	....	
83,760	12,000	.0166	.0009	
85,156	12,200	.0169	....	
86,552	12,400	.0172	....	Snapping sounds.
89,900	....	....	....	Pieces flew off sides of brick.
110,100	....	....	....	Crushing strength.

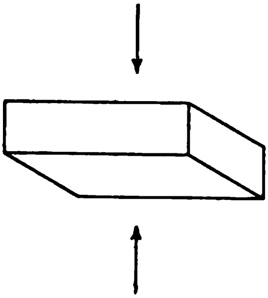
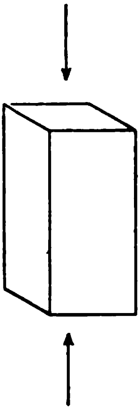
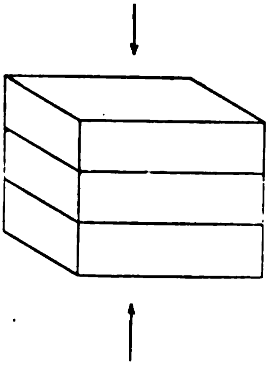
TABULATION OF COMPRES-

No. of test.	Style of specimen.	Color of surface.	Dimensions.		
			Height.	Compressed service.	
			Inches.	*Inches.*	*Inches.*
447		Dark red	2.08	7.65	3.26
448		Light red	2.18	7.84	3.37
449		Medium red	2.18	7.75	3.32
450		do	2.12	7.60	3.27
459		do	2.15	7.64	3.30
451			7.60	3.35	2.18
452			7.80	3.40	2.28
469		Light red	7.60	3.36	2.26
470		do	7.90	3.46	2.27
471		do	7.68	3.37	2.27
472		Medium red	7.70	3.33	2.24
473		do	7.58	3.28	2.20
474		do	7.55	3.31	2.20
475		Dark red	7.50	3.23	2.20
476		do	7.4[illegible]	3.18	2.18
477		do	[illegible]	3.20	2.18
453		Medium red	6.45	7.60	3.28
454		do	6.45	7.50	3.25
455		do	6.60	7.53	3.20

SION OF COMMON BRICKS.

Sectional area.	Cracks in sight.	Crushing strength.		Remarks.
		Total.	Per square inch.	
Sq. inches.	*Pounds.*	*Pounds.*	*Pounds.*	
24.9	168,000	472,900	18,990	
26.4	220,000	330,100	12,500	
25.7	188,000	378,200	14,720	
24.8	244,000	410,000	16,530	
25.2	242,000	412,000	16,350	
7.3	61,820	103,400	14,160	E=3,750,000.
7.75	....	69,500	8,970	E=2,360,000.
7.59	....	58,100	7,650	E=2,200,000.
7.85	54,950	56,400	7,180	E=1,700,000.
7.65	....	60,300	7,880	E=2,700,000.
7.46	68,632	78,200	10,480	E=2,700,000.
7.22	....	63,536	8,800	E=3,750,000.
7.28	74,000	89,500	12,290	E=3,750,000.
7.75	82,150	101,700	13,120	E=3,750,000.
6.93	63,756	91,900	13,260	E=5,000,000.
6.98	89,900	110,100	15,770	E=4,600,000.
24.5	25,000	69,800	2,850	The bricks were badly shattered at 50,000 pounds compression. When the maximum load, 69,800 pounds was reached, the contents of the largest fragment was less than two cubic inches.
24.4	29,500	104,600	4,290	Cracks continued to develop from the time when first observed till the highest load was reached, when the middle brick was reduced to fragments of two cubic inches contents and smaller. There was less injury done the end bricks.
24.1	60,000	97,100	4,030	Cracks progressed slowly between 60,000 and 80,000 pounds, but from the latter load to the maximum, rapid deterioration occurred.

TABULATION OF COMPRES

No. of test.	Style of specimen.	Color of surface.	Dimensions.		
			Height.	Compressed service.	
			Inches.	*Inches.*	*Inches.*
456			2.10	7.70	3.55
457			2.15	7.72	3.57
458			2.16	7.70	3.57
460		Dark red	7.70	3.52	2.16
461		do	7.70	3.50	2.14
465		do	7.78	3.60	2.16
466		do	7.68	3.58	2.21
467		do	7.70	3.58	2.10
468		do	7.70	3.62	2.16
462		Dark red	6.30	7.63	3.53
463		do	6.60	7.83	3.60
464		do	6.60	7.70	3.50

SION OF FACE BRICKS.

Sectional area.	Cracks in sight.	Crushing strength. Total.	Crushing strength. Per square inch.	Remarks.
Sq. inches.	*Pounds.*	*Pounds.*	*Pounds.*	
27.3	158,000	369,200	13,520	
27.6	148,000	330,200	11,960	
27.5	262,000	401,000	14,580	
7.60	57,760	61,800	8,130	E=4,070,000.
7.49	....	59,700	7,970	E=3,080,000.
7.78	46,680	54,200	6,970	E=3,150,000.
7.91	50,624	56,500	7,140	E=3,750,000.
7.52	36,096	42,900	5,700	E=3,300,000.
7.82	45,356	46,920	6,000	E=2,500,000.
26.9	73,000	103,100	3,830	The development of the cracks from the time first observed progressed slowly till near the close of the tests, when the disintegration was rapid, terminating with a slight explosion. The interior portions of the bricks were a much lighter red than the outside. The line of demarkation, which was very sharp, averaged ⅛" below the original surface.
28.2	78,500	106,800	3,790	
26.9	55,600	98,280	3,650	

35.—CAST-IRON BARS.

TRANSVERSE TESTS OF CUPOLA IRON, CAST IN GREEN SAND FROM THE ARSENAL FOUNDRY.

This series of tests comprises twenty-four bars varying in depth from ⅜″ to 2″, and as cast were 3″ wide, all taken from the same ladle of metal.

Eighteen bars were tested with the original surface on the tension and compression sides undisturbed. Twelve of this number had their edges planed, reducing the breadth from 3″ to 2″, while the six thinner bars were found too hard to plane, and were left nearly their original breadth.

Six 3″×2″ bars were planed to 2″ wide and to depths of 1¾″, 1½″, and 1¼″ respectively, removing the same amount of metal from each opposite face.

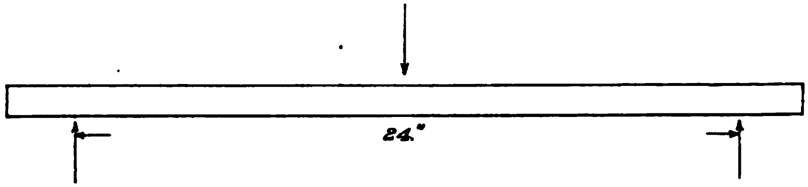
These tests will therefore show the comparative transverse resistance of bars retaining the original surface of the casting, and where the percentages of interior metal varies; also, the resistance of bars which have had the surface metal planed off to different depths.

The thin bars, ⅜″ and ½″, were very hard throughout, and the metal at the corners was white and silvery. The thicker bars showed gray metal, with fine granulation next the surface, which gradually changed to coarser metal towards the center.

The highest modulus of rupture is found in the thinner bars. The variations in strength become less conspicuous as the depth increases.

The dressed bars show greater uniformity of results, and an increase in strength over corresponding bars of their original thickness.

The removal of defective surface metal favors the employment of dressed bars.



The formulæ employed in computing the maximum fiber strain and the modulus of elasticity were as follows:

$$R=\frac{3\,P\,l}{2\,b\,d^2} \qquad E=\frac{R\,l^2}{6\,d\,\Delta}$$

where

P=load in pounds applied at middle.
l =length between end supports in inches.
b =breadth in inches.
d =depth in inches.
Δ=deflection at middle in inches.

No. 5.

The following bars were too hard at the edges to plane:

($\frac{3}{8}''$ bar.)

Breadth, 3″.03.
Depth, ″.40.
One edge very rough, where the attempt was made at planing.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
27	2, 000	0.	0.	Initial load.
54	4, 000	.0309	....	
81	6, 000	.0628	....	
108	8, 000	.0939	....	
135	10, 000	.1120	.0060	
162	12, 000	.1501	....	E = 16,271,000 between 10,000 and 20,000 pounds.
189	14, 000	.1772	....	
215	16, 000	.2081	....	
242	18, 000	.2360	....	
269	20, 000	.2672	.0188	
296	22, 000	.3045	....	
323	24, 000	.3318	....	
350	26, 000	.3625	....	
377	28, 000	.3356	....	
404	30, 000	.4302	.0278	
431	32, 000	.4780	....	
458	34, 000	.5038	....	
485	36, 000	.5375	....	
512	38, 000	.5760	....	
539	40, 000	.6100	.0541	
566	42, 000	.6428	....	
632	48, 400	....	....	Ultimate strength.

Fractured 1″ from the middle. Appearance uniformly fine granular, with white spots at corners of bar.

Snapping sounds were frequently heard near the close of the test.

No. 6.

(⅜″ bar.)

Breadth, 2″.96.
Depth, ″.36.
One edge very rough where the attempt was made at planing.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
21	2,000	0.	0.	Initial load.
48	4,000	.0310	....	
64	6,000	.0635	....	
85	8,000	.0912	....	
107	10,000	.1195	.0068	
128	12,000	.1582	....	
149	14,000	.1802	....	E = 18,461,000 between 10,000 and 20,000 pounds.
170	16,000	.2103	....	
192	18,000	.2410	....	
213	20,000	.2708	.0140	
234	22,000	.3070	....	
256	24,000	.3368	....	
277	26,000	.3660	....	
298	28,000	.4003	....	
320	30,000	.4330	.0261	
341	32,000	.4780	....	Snapping sound.
362	34,000	.5060	....	
384	36,000	.5510	....	
405	38,000	.5910	....	
426	40,000	.6380	.0510	
448	42,000	.6940	....	
466	43,740	....	....	Ultimate strength.

Fractured at the middle. Fine-grained. White metal at the edges ″.2 deep.

No. 7.

(½″ bar.)

Breadth, 3″.00.
Depth, ″.51.
One edge very rough where attempt was made to plane it.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
43	2,000	0.	0.	Initial load.
87	4,000	.0230	....	
130	6,000	.0429	....	
173	8,000	.0658	....	
217	10,000	.0875	.0047	
260	12,000	.1155	....	E = 16,551,000 between 10,000 and 20.000 pounds.
303	14,000	.1356	....	
347	16,000	.1600	....	
390	18,000	.1835	....	
434	20,000	.2087	.0125	
477	22,000	.2360	....	
520	24,000	.2563	....	
564	26,000	.2832	....	
607	28,000	.3110	....	
650	30,000	.3386	.0300	Snapping sound.
694	32,000	.3745	....	
737	34,000	.3950	....	
780	36,000	.4263	....	
824	38,000	.4580	....	
867	40,000	.4893	.0531	
910	42,000	.5245	....	
954	44,000	.5620	....	
997	46,000	.5970	....	
1,038	47,910	....	....	Ultimate strength.

Fine close-grained fracture. Traces of white metal at the corners.

No. 8.

(½″ bar.)

Breadth, 3″.04.
Depth, ″.50.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber.			
Pounds.		*Inch.*	*Inch.*	
42	2,000	0.	0.	Initial load.
84	4,000	.0265	....	
127	6,000	.0510	....	
169	8,000	.0745	....	
211	10,000	.0993	.0091	
253	12,000	.1302	....	E = 15,238,000 between 10,000 and 20,000 pounds.
296	14,000	.1530	....	
338	16,000	.1795	....	
380	18,000	.2056	....	
422	20,000	.2345	.0178	
464	22,000	.2670	....	
507	24,000	.2938	....	
549	26,000	.3230	....	
591	28,000	.3510	....	
633	30,000	.3820	.0328	
676	32,000	.4195	....	
718	34,000	.4492	....	
760	36,000	.4860	....	Snapping sound.
802	38,000	.5208	....	
844	40,000	.5585	.0670	
887	42,000	.6010	....	
925	44,110	....	....	Ultimate strength.

Fine close-grained fracture. White iron at corners.

No. 9.

(⅝″ bar.)

Breadth, 2″.90.
Depth, ″.61.
One edge very rough where planing was attempted.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
60	2,000	0.	0.	Initial load.
120	4,000	.0283	....	
180	6,000	.0410	....	
240	8,000	.0561	....	
300	10,000	.0765	.0091	
360	12,000	.0948	....	E = 17,143,000 between 10,000 and 20,000 pounds.
420	14,000	.1140	....	
480	16,000	.1345	....	
540	18,000	.1535	....	
600	20,000	.1732	.0135	
659	22,000	.1956	....	
719	24,000	.2165	....	
779	26,000	.2370	....	
839	28,000	.2591	....	
899	30,000	.2831	.0266	Snapping sound.
959	32,000	.3110	....	
1,019	34,000	.3306	....	
1,079	36,000	.3560	....	
1,139	38,000	.3847	....	
1,199	40,000	.4152	.0509	
1,259	42,000	.4509	....	
1,319	44,000	....	....	Ultimate strength.

Fine close-grained metal. White iron at corners.

No. 10.

($\frac{5}{8}''$ bar.)

Breadth, 2″.98.
Depth, ″.64.
One edge very rough where planing was attempted.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
68	2,000	0.	0.	Initial load.
136	4,000	.0154	....	
203	6,000	.0337	....	
271	8,000	.0515	....	
339	10,000	.0700	.0026	
407	12,000	.0910	....	E=16,000.000 between 10,000 and 20,000 lbs.
475	14,000	.1089	....	
542	16,000	.1290	....	
610	18,000	.1487	....	
678	20,000	.1691	.0061	
746	22,000	.1902	....	
814	24,000	.2135	....	
882	26,000	.2360	....	
949	28,000	.2608	....	
1,017	30,000	.2846	.0234	
1,085	32,000	.3120	....	
1,153	34,000	.3378	....	
1,221	36,000	.3641	....	
1,288	38,000	.3942	....	
1,356	40,000	.4287	.0528	
1,390	41,020	....	....	Ultimate strength.

Fractured 1″ from middle, at small defective spot on tension side. Fine, close-grained appearance.

No. 11.

($\frac{3}{4}''$ bar.)

Breadth, 2″.
Depth, ″.74.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
61	2,000	0.	0.	Initial load.
122	4,000	.0171	....	
182	6,000	.0326	....	
243	8,000	.0481	....	
304	10,000	.0618	.0018	
365	12,000	.0806	....	
426	14,000	.0978	....	E=16,271,000 between 10,000 and 20,000 pounds.
487	16,000	.1145	....	
548	18,000	.1325	....	
608	20,000	.1508	.0110	
669	22,000	.1743	....	
730	24,000	.1913	....	
791	26,000	.2121	....	
852	28,000	.2333	....	
913	30,000	.2548	.0278	
973	32,000	.2785	....	
1,034	34,000	.3018	....	
1,095	36,000	.3273	....	
1,156	38,000	.3538	....	
1,217	40,000	.3853	.0389	
1,278	42,000	.4220	....	
1,290	42,410	....	....	Ultimate strength.

Fractured opposite middle bearing. Appearance fine, granular; coarser center.

No. 12.

(¾″ bar.)

Breadth, 2″.00.
Depth, ″.77.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
66	2,000	.0	.0	Initial load.
132	4,000	.0148	....	
198	6,000	.0297	....	
264	8,000	.0453	....	
329	10,000	.0602	.0037	
395	12,000	.0780	....	E=15,287,000 between 10,000 and 20,000 pounds.
461	14,000	.0930	....	
527	16,000	.1115	....	
593	18,000	.1300	....	
659	20,000	.1490	.0107	
725	22,000	.1700	....	
791	24,000	.1881	....	
856	26,000	.2085	....	
922	28,000	.2300	....	
988	30,000	.2521	.0265	
1,054	32,000	.2785	....	
1,120	34,000	.3009	....	
1,186	36,000	.3252	....	
1,252	38,000	.3550	....	
1,318	40,000	.3840	.0390	
1,383	42,000	.4198	....	
1,390	42,:90	....	....	Ultimate strength.

Fractured opposite middle bearing. Appearance fine, granular; coarser center.

No. 13.

(1″ bar.)

Breadth, 2″.00.
Depth, ″.99.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
109	2,000	.0	.0	Initial load.
218	4,000	.0139	....	
327	6,000	.0285	....	
436	8,000	.0431	....	
545	10,000	.0581	.0041	
653	12,000	.0721	....	E = 14,328,000 between 10,000 and 20,000 pounds.
762	14,000	.0861	....	
871	16,000	.1020	....	
980	18,000	.1186	....	
1,089	20,000	.1350	.0132	
1,198	22,000	.1540	....	
1,307	24,000	.1708	....	
1,416	26,000	.1900	....	
1,525	28,000	.2100	....	
1,634	30,000	.2320	.0311	
1,742	32,000	.2548	....	
1,820	33,430	....	....	Ultimate strength.

Fractured at blow holes $\frac{3}{16}$″ deep on tension side nearly opposite the middle bearing. The fractured surface otherwise fine granular; increasing in coarseness towards the center.

No. 14.

(1″ bar.)

Breadth, 2″.00.
Depth, 1″.02.
Edges planed.

Applied loads,		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
116	2,000	0.	0.	Initial load.
231	4,000	.0117	....	
347	6,000	.0230	....	
462	8,000	.0347	....	
578	10,000	.0478	.0030	
694	12,000	.0611	....	E = 15,483,000; between 10,000 and 20,000.
809	14,000	.0734	....	
925	16,000	.0870	....	
1,040	18,000	.1005	....	
1,156	20,000	.1148	.0088	
1,272	22,000	.1300	....	
1,387	24,000	.1442	....	
1,503	26,000	.1598	....	
1,619	28,000	.1758	....	
1,734	30,000	.1931	.0205	
1,850	32,000	.2127	....	
1,965	34,000	.2300	....	
2,081	36,000	.2489	....	
2,197	38,000	.2710	....	
2,312	40,000	.2948	.0495	
2,348	40,640	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular, coarser center.

No. 15.

(1¼″ bar.)

Breadth, 2″.00.
Depth, 1″.28.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
182	2,000	0.	0.	Initial load.
364	4,000	.0097	....	
546	6,000	.0192	....	
728	8,000	.0290	....	
910	10,000	.0380	.0030	
1,092	12,000	.0491	....	E = 15,238,000; between 10,000 and 20,000 pounds.
1,274	14,000	.0591	....	
1,456	16,000	.0703	....	
1,639	18,000	.0812	....	
1,821	20,000	.0926	.0085	
2,003	22,000	.1051	....	
2,185	24,000	.1170	....	
2,367	26,000	.1300	....	
2,549	28,000	.1431	....	
2,731	30,000	.1580	.0208	
2,913	32,000	.1735	....	
3,095	34,000	.1898	....	
3,277	36,000	.2071	....	
3,459	38,000	.2255	....	
3,602	39,590	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular, coarser center.

No. 16.

(1¼″ bar.

Breadth, 2″.00.
Depth, 1″.30.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
188	2,000	0.	0.	Initial load.
376	4,000	.0091	....	
563	6,000	.0182	....	
751	8,000	.0277	....	
939	10,000	.0376	.0030	
1,127	12,000	.0486	....	E = 16,000,000 between 10,000 and 20,000 pounds.
1,315	14,000	.0569	....	
1,502	16,000	.0678	....	
1,690	18,000	.0780	....	
1,878	20,000	.0890	.0085	
2,066	22,000	.1012	....	
2,253	24,000	.1124	....	
2,441	26,000	.1248	....	
2,629	28,000	.1383	....	
2,817	30,000	.1505	.0185	
3,005	32,000	.1640	....	
3,193	34,000	.1780	....	
3,380	36,000	.1938	....	
3,568	38,000	.2087	....	
3,756	40,000	.2281	....	
3,884	41,370	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular, coarser center.

No. 17.

(1½″ bar.)

Breadth, 2″.00.
Depth, 1″.55.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
267	2,000	0.	0.	Initial load.
534	4,000	.0092	....	
801	6,000	.0193	....	
1,068	8,000	.0272	....	
1,335	10,000	.0360	.0031	
1,602	12,000	.0451	....	E = 15,400,000 between 10,000 and 20,000 pounds.
1,869	14,000	.0540	....	
2,136	16,000	.0625	....	
2,403	18,000	.0720	....	
2,670	20,000	.0815	.0095	
2,937	22,000	.0918	....	
3,204	24,000	.1022	....	
3,471	26,000	.1134	....	
3,738	28,000	.1248	....	
4,005	30,000	.1370	.0201	
4,272	32,000	.1503	....	
4,539	34,000	.1650	....	
4,806	36,000	.1805	....	
4,880	36,560	....	....	Ultimate strength.

Fractured 2½″ from middle of bar, at defective metal on the tension side, $\frac{3}{16}$″ deep × 1″.00 long. Appearance granular; coarser center.

No. 18.

(1½″ bar.)

Breadth, 2″.00.
Depth, 1″.52.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
257	2,000	0.	0.	Initial load.
513	4,000	.0082	....	
770	6,000	.0170	....	
1,027	8,000	.0251	....	
1,284	10,000	.0340	.0030	
1,540	12,000	.0420	....	E=15.238,000, between 10,000 and 20,000 pounds.
1,797	14,000	.0510	....	
2,054	16,000	.0605	....	
2,311	18,000	.0700	....	
2,567	20,000	.0800	.0084	
2,824	22,000	.0900	....	
3,081	24,000	.1015	....	
3,338	26,000	.1130	....	
3,594	28,000	.1248	....	
3,851	30,000	.1381	.0210	
4,108	32,000	.1533	....	
4,365	34,000	.1680	....	
4,621	36,000	.1841	....	
4,878	38,000	.2015	....	
4,952	38,590	....	....	Ultimate strength.

Fractured at the middle, at defective spot ⅜″ long × 3/16″ deep on tension side. Appearance fine granular; coarser center.

No. 019.

(1¾″ bar.)

Breadth, 2″.00.
Depth, 1″.75.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
340	2,000	0.	0.	Initial load.
681	4,000	.0070	....	
1,021	6,000	.0147	....	
1,361	8,000	.0221	....	
1,702	10,000	.0300	.0023	
2,042	12,000	.0382	....	E=14,769,000, between 10,000 and 20,000 pounds.
2,382	14,000	.0464	....	
2,722	16,000	.0545	....	
3,063	18,000	.0632	....	
3,403	20,000	.0721	.0072	
3,743	22,000	.0808	....	
4,084	24,000	.0902	....	
4,424	26,000	.1005	....	
4,764	28,000	.1109	....	
5,105	30,000	.1228	.0185	
5,445	32,000	.1345	....	
5,785	34,000	.1480	....	
6,048	35,550	....	....	Ultimate strength.

Fractured ¾″ from middle of bar. Slight defect in metal on tension side. Appearance fine granular; coarser center.

No. 20.

(1¾″ bar.)

Breadth, 2″.00.
Depth, 1″.75.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
340	2, 000	0.	0.	Initial load.
681	4, 000	.0071	....	
1, 021	6, 000	.0140	....	
1, 361	8, 000	.0215	....	
1, 702	10, 000	.0291	.0019	
2, 042	12, 000	.0361	....	E=15,238,000, between 10,000 and 20,000 pounds.
2, 382	14, 000	.0450	....	
2, 722	16, 000	.0520	....	
3, 063	18, 000	.0610	....	
3, 403	20, 000	.0711	.0079	
3, 743	22, 000	.0809	....	
4, 084	24, 000	.0915	....	
4, 424	26, 000	.1020	....	
4, 764	28, 000	.1135	....	
5, 105	30, 000	.1248	.0196	
5, 445	32, 000	.1390	....	
5, 785	34, 000	.1520	....	
5, 880	34, 560	....	....	Ultimate strength.

Fractured at middle. Slight defect in metal on tension side. Appearance fine granular; coarser center.

No. 21.

(2″ bar.)

Breadth, 2″.00.
Depth, 2″.03.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
458	2, 000	0.	0.	Initial load.
916	4, 000	.0038	....	
1, 374	6, 000	.0118	....	
1, 832	8, 000	.0195	....	
2, 290	10, 000	.0267	—.0008	
2, 748	12, 000	.0343	....	
3, 205	14, 000	.0423	....	E=13,913,000, between 10,000 and 20,000 pounds.
3, 663	16, 000	.0500	....	
4, 121	18, 000	.0580	....	
4, 579	20, 000	.0662	.0049	
5, 037	22, 000	.0751	....	
5, 495	24, 000	.0842	....	
5, 953	26, 000	.0939	....	
6, 411	28, 000	.1038	....	
6, 869	30, 000	.1143	.0161	
7, 327	32, 000	.1200	....	
7, 785	34, 000	.1375	....	
8, 200	35, 830	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular; coarser center.

No. 22.

(2" bar.)

Breadth, 2".00.
Depth, 2".00.
Edges planed.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
445	2,000	0.	0.	Initial load.
889	4,000	.0079	....	
1,334	6,000	.0159	....	
1,778	8,000	.0247	....	
2,223	10,000	.0331	.0038	
2,667	12,000	.0426	....	
3,112	14,000	.0494	....	E = 13,520,000 between 10,000 and 20,000 pounds.
3,556	16,000	.0581	....	
4,001	18,000	.0660	....	
4,445	20,000	.0744	.0097	
4,890	22,000	.0835	....	
5,334	24,000	.0922	....	
5,779	26,000	.1015	....	
6,223	28,000	.1102	....	
6,668	30,000	.1205	.0207	
7,112	32,000	.1322	....	
7,557	34,000	.1435	....	
8,001	36,000	.1562	....	
8,305	37,870	....	....	Ultimate strength.

The following bars were dressed all over:

No. 23.

(2" bar planed down to 1¾" thick.)

Breadth, 2".00.
Depth, 1".75.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
340	2,000	0.	0.	Initial load.
681	4,000	.0070	....	
1,021	6,000	.0138	....	
1,361	8,000	.0210	....	
1,702	10,000	.0290	.0026	
2,042	12,000	.0371	....	E = 14,117,000 between 10,000 and 20,000 pounds.
2,382	14,000	.0458	....	
2,722	16,000	.0547	....	
3,063	18,000	.0640	....	
3,403	20,000	.0740	.0088	
3,743	22,000	.0835	....	
4,084	24,000	.0945	....	
4,424	26,000	.1055	....	
4,764	28,000	.1170	....	
5,105	30,000	.1293	.0224	
5,445	32,000	.1445	....	
5,785	34,000	.1565	....	
6,125	36,000	.1725	....	
6,466	38,000	.1910	....	
6,600	38,790	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular; coarser center.

No. 24.

(2″ bar planed down to 1¾″ thick.)

Breadth, 2″.00.
Depth, 1″.76.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
344	2,000	0.	0.	Initial load.
688	4,000	.0071	....	
1,033	6,000	.0134	....	
1,377	8,000	.0207	....	
1,721	10,000	.0284	.0024	
2,065	12,000	.0365	....	
2,409	14,000	.0447	....	E = 14,769,000 between 10,000 and 20,000 pounds.
2,754	16,000	.0531	....	
3,098	18,000	.0621	....	
3,442	20,000	.0712	.0085	
3,786	22,000	.0812	....	
4,130	24,000	.0913	....	
4,475	26,000	.1022	....	
4,819	28,000	.1147	....	
5,163	30,000	.1255	.0218	
5,507	32,000	.1384	....	
5,851	34,000	.1523	....	
6,196	36,000	.1670	....	
6,540	38,000	.1839	....	
6,838	39,740	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular; coarser center.

No. 25.

(2″ bar planed down to 1½″ thick.)

Breadth, 2″.
Depth, 1″.50.

Applied loads.		Deflection.	Deflection set.	Remarks.
Total.	Maximum fiber strain.			
Pounds.		*Inch.*	*Inch.*	
250	2,000	0.	0.	Initial load.
500	4,000	.0079	....	
750	6,000	.0161	....	
1,000	8,000	.0243	....	
1,250	10,000	.0338	.0030	
1,500	12,000	.0432	....	E = 14,840,000 between 10,000 and 20,000 pounds.
1,750	14,000	.0529	....	
2,000	16,000	.0631	....	
2,250	18,000	.0740	....	
2,500	20,000	.0848	.0109	
2,750	22,000	.0962	....	
3,000	24,000	.1089	....	
3,250	26,000	.1215	....	
3,500	28,000	.1353	....	
3,750	30,000	.1500	.0261	
4,000	32,000	.1655	....	
4,250	34,000	.1822	....	
4,500	36,000	.2010	....	
4,750	38,000	.2220	....	
4,990	39,920	....	....	Ultimate strength.

Fractured at middle. Appearance fine granular; coarser center.

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